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I-680 TO EPPLEY AIRFIELD CORRIDOR STUDY

FINAL REPORT

Prepared for
Metropolitan Area Planning Agency
City of Omaha, Nebraska
Omaha Airport Authority

July 1999

Prepared by
HDR Engineering, Inc.

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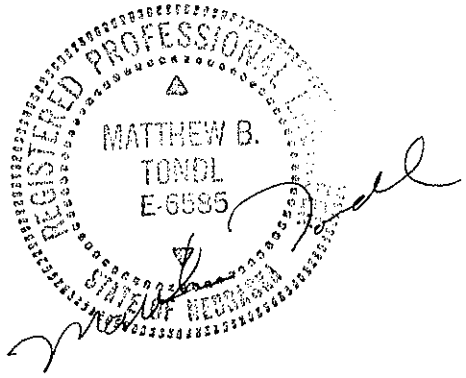

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CHAPTER 1: INTRODUCTION

BASIS FOR THE STUDY

The need for an improved roadway connection in this area dates back to the 1960's. Strong public opposition to an extension of the North Freeway to I-680 caused the further development of the roadway to cease in the mid 1970's. Eppley Airfield was not a major traffic generation factor during that time period. In recognition of the tremendous growth at Eppley and infill of the underutilized industrial area, the recent Long Range Transportation Plan for the Omaha Metropolitan area included a connection from the Storz Expressway to I-680 via the railroad right of way in the area. However the viability of that connection has not undergone rigorous study. Additionally any further development of an improved route must be accompanied by a rigorous study that clearly identifies the purpose and need for the facility.

The primary objective of this study was to identify the need for, the type of, and location of a transportation facility to serve as a connection between I-680 and Eppley Airfield. The reason for undertaking this study was not rooted in the need to increase roadway capacity in a crowded corridor. Unlike "traditional" corridor studies in congested areas where the primary objective is to determine ways to increase roadway capacity, this study's objective was based on the desire to improve ***access*** between I-680 and the airport and the surrounding industrial area. Improving airport access from I-680 will help eliminate confusion caused by the existing routes that often result in wasted time and lost drivers.

The Roadway Component

Unlike most major airports in the United States, Eppley Airfield does not have near-by, direct access to the Interstate system. The primary access to Eppley from the north from I-29, I-80, and I-680 is along the Pershing Drive/Abbott Drive roadway. Although signed to direct drivers to the airport, this is a very confusing route for people not familiar with the area. The undesirable characteristics of this route include:

- Four right angle turns;
- Three all-way stops;
- Mostly two-lane roads designed to minor arterial/collector standards;
- Several name changes on the same street;
- A segment that is privately-owned by MUD and is weight restricted. This requires a separate truck route to the airport; and
- Poor pavement condition along much of Pershing Drive and Abbott Drive.

The Demand Component

Eppley Airfield has a well-earned reputation as one of the most "user-friendly" of all of the nation's major airports. It has the unique ability to handle nearly four million passengers per year, yet still provide users with the ease and convenience found at airports handling significantly lower passenger volumes. With a wide variety of airlines

offering low fares and direct flights or connections to anywhere in the world, Eppley Airfield's area of attraction has grown to include cities such as North Platte, NE; Sioux Falls, SD; and Des Moines, IA. In fact, Eppley Airfield has ranked as one of the fastest growing airports in its class in the United States in recent years.

The increase in current and future airline passengers is not the sole reason that roadway traffic volumes have been growing in and around Eppley Airfield. The industrial areas to the north and west of the airport have grown significantly in the 1990's, resulting in additional traffic. The recent construction of a 24-hour US Post Office, and the tremendous increase in air cargo shipped into and out of Eppley Airfield have all added significantly to traffic in the study area. Not only does this industrial/air cargo activity add to total vehicle demand, but it also adds the complications that arise with the presence of trucks.

STUDY OBJECTIVES

The primary objective of this study was to identify the need for, the type of, and location of a transportation facility to serve as a connection between Eppley Airfield and I-680. In order to meet this objective, the study considered three phases of corridor improvements: immediate, short-term and long-term.

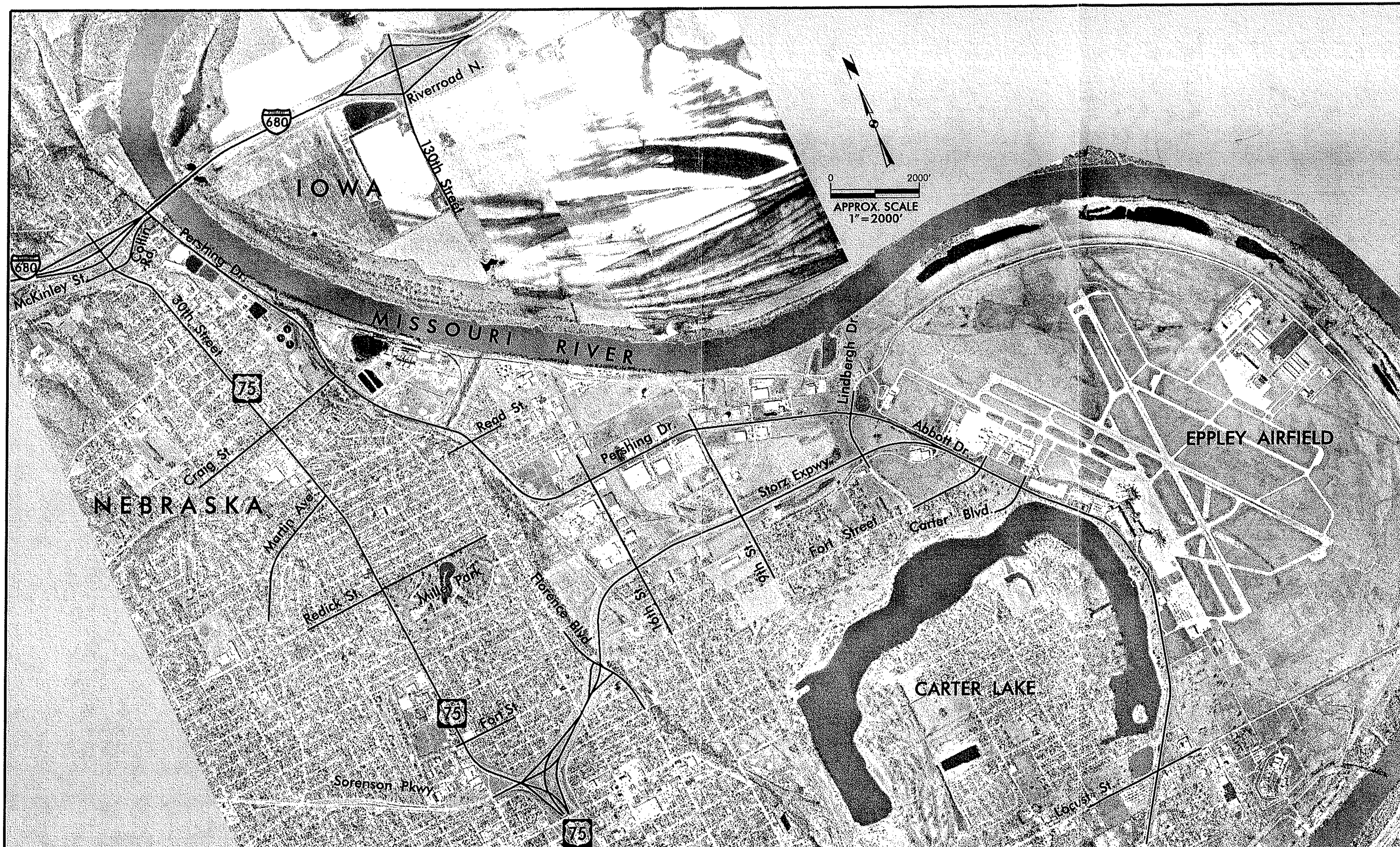
Immediate improvements are typically intended to address safety related or route guidance problems. Further, immediate improvements typically do not solve the overall corridor problems but they can buy valuable time needed to address the real corridor problems.

Short-term improvements expand on safety related and route guidance issues. Additionally, short-term improvements can begin to address capacity related problems and continue to provide time until the ultimate corridor solution can be implemented. Ideally, short-term improvements can be integrated into the long-term solutions and not become "throw-away" measures.

Long-term improvements address the contributing circumstances facing the corridor. Rather than treat the symptom, like immediate and short-term improvements, long-term improvements treat the cause of the symptoms. Long-term improvements typically require significant capital expenditures and significant development and implementation time.

STUDY AREA

The study area is shown in Exhibit 1-1. To ensure that all possible routes were considered, the development and assessment of study alternatives was not constrained by physical boundaries. However, logical boundaries were applied to the traffic analysis activities of the study. The boundaries are I-680 to the north, Storz Expressway to the south, 30th Street to the west, and I-29 to the east.



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STUDY AREA

EXHIBIT
1–1

STUDY METHODOLOGY/ PROJECT APPROACH

A systematic approach was utilized to develop the corridor recommendations for immediate, short-term, and long-term improvements. The study tasks followed were:

1. Data Assembly/Problem Identification
   - Formation of the Technical Advisory Committee (TAC)
   - Conduct origin-destination survey of airport-related traffic
   - Conduct mail-out survey of businesses in vicinity of Eppley Airfield
   - Inventory of existing traffic volumes and projected traffic volumes
   - Macroscopic level traffic analysis of the existing corridor routes and key intersections
   - Detailed inventory of existing corridor characteristics such as: number of lanes, traffic control devices, signing, posted speed limits, access control, parking, etc.
   - Field inspections to verify existing conditions
   - Identification of corridor constraints (such as parks, wetlands, etc.)
   - Development of detailed base mapping in CAD

2. Alternative Development and Evaluation
   - Development of alternative corridor improvements
   - Identification of impacts and benefits
   - Development of concept level construction cost estimates

3. Identification of the Recommend Alternative
   - Refinement of the recommended alternative
   - Development of an implementation plan
   - Preparation of the study report

STUDY PARTICIPANTS

This study was conducted under the guidance of a Technical Advisory Committee (TAC) comprised of staff from the Metropolitan Area Planning Agency (MAPA), City of Omaha Public Works Department, City of Omaha Planning Department, and the Omaha Airport Authority (OAA). Specify committee members were:

Paul Mullen	Program Director, Metropolitan Area Planning Agency
Ralph Holtmann	Omaha Airport Authority
Charlie Krajicek	City of Omaha Traffic Engineer
Steve Jensen	City of Omaha Planning Director
David Cary	City of Omaha Panning Department

In addition to the above TAC members, staff from the Mayor's office and the Metropolitan Utilities District (MUD) attended various TAC meetings for informational purposes. Coordination meetings were also held with staff from the Iowa Department of Transportation (IaDOT), the Nebraska Department of Roads (NDOR) and the Omaha Public Power District (OPPD).

REMAINDER OF THE REPORT

The remainder of this report has been divided into the following chapters:

Chapter 2: Existing Conditions
Chapter 3: Travel Surveys
Chapter 4: Future Conditions
Chapter 5: Corridor Alternatives
Chapter 6: Recommended Corridor Improvements
Chapter 7: Long Term System Potential
Chapter 8: Public Involvement
Chapter 9: Summary/Conclusions

CHAPTER 2: EXISTING CONDITIONS

EXISTING STREET SYSTEM

The existing signed routes to Eppley Airfield that are relevant to this study are shown in Exhibit 2-1. The existing signing consists of various sizes and types of signs including overhead signs (on I-680), ground-mounted signs and trailblazer signs mounted on traffic signal poles and light poles.

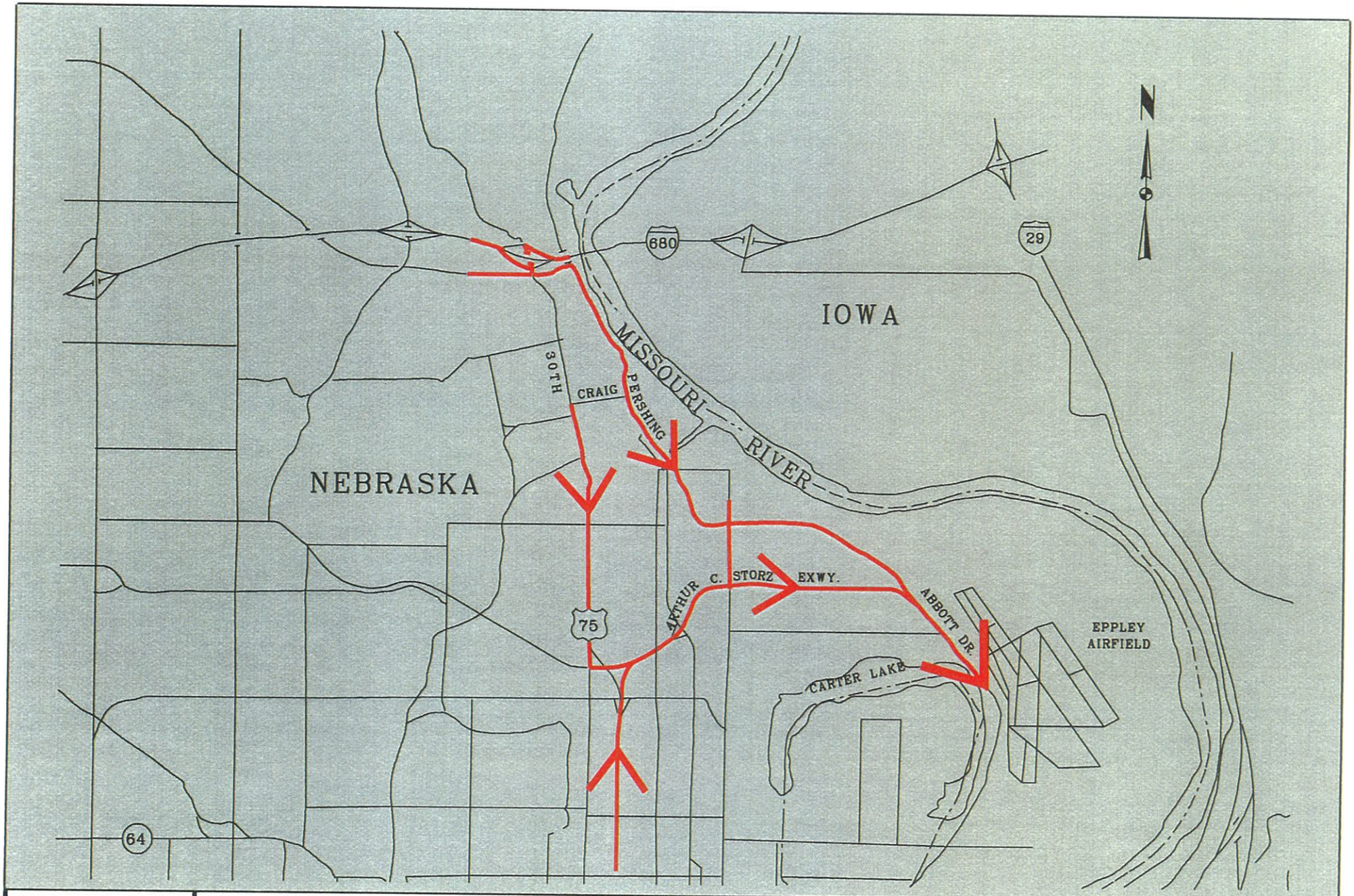
The primary route from I-680 utilizes portions of 30th Street, Dick Collins Road, Pershing Drive and Abbott Drive. A secondary route is provided along 30th Street and the Storz Expressway although such signing does not appear until south of Craig Road. For trucks approaching Eppley Airfield or the industrial area surrounding the airport, the signed route is along 30th Street, then east on Craig Street, then south/southwest along Pershing Drive. Each of these streets is described in greater detail in the following paragraphs.

Dick Collins Road is a two-lane roadway that extends from 30th Street (signalized intersection) to Pershing Drive (3-way stop controlled intersection). To the west of 30th Street, this roadway is designated as McKinley Street.

30th Street, between the Storz Expressway and McKinley Street is designated U.S. Highway 75. During the 1970's 30th Street was suggested as a potential corridor for connecting the North Freeway between I-680 and the Storz Expressway. This alternative as well as other alternatives that were considered for this connection were dropped as a result of intense public opposition. The cross section of 30th Street varies between I-680 and the Storz Expressway. On the north end, a four-lane divided section is provided. Within the Florence business district, a four-lane undivided section is provided to allow on-street parking. A five-lane section is provided between Craig Street and Martin Avenue. A four-lane undivided section with left-turn lanes at key intersections is provided from Martin Avenue to just north of the Storz Expressway. The 30th Street corridor has nine signalized intersections, five pedestrian signals, and numerous uncontrolled access points such as business drives and single-unit dwelling driveways.

Pershing Drive is primarily a two-lane roadway between Dick Collins Road and 16th Street. The exception occurs between Craig Street and Florence Boulevard where four lanes are provided. The intersections of Pershing Drive with Dick Collins Road, Read Street and 16th Street are all-way stop controlled. Additionally, several at-grade railroad crossings exist on Pershing Drive (between 16th and 9th Streets) and Craig Street. Trucks are currently prohibited on Pershing Drive in the vicinity of MUD due to concerns regarding the potential damage that might occur to underground pipes in the area. As such, the signed route for airport or industrial area bound trucks is along 30th Street, Craig Street and Pershing Drive.

The existing signed route from Eppley Airfield to I-680 is shown in Exhibit 2-2. These signs consist entirely of trailblazer signs (i.e., interstate shields) mounted on existing traffic signal or light poles.



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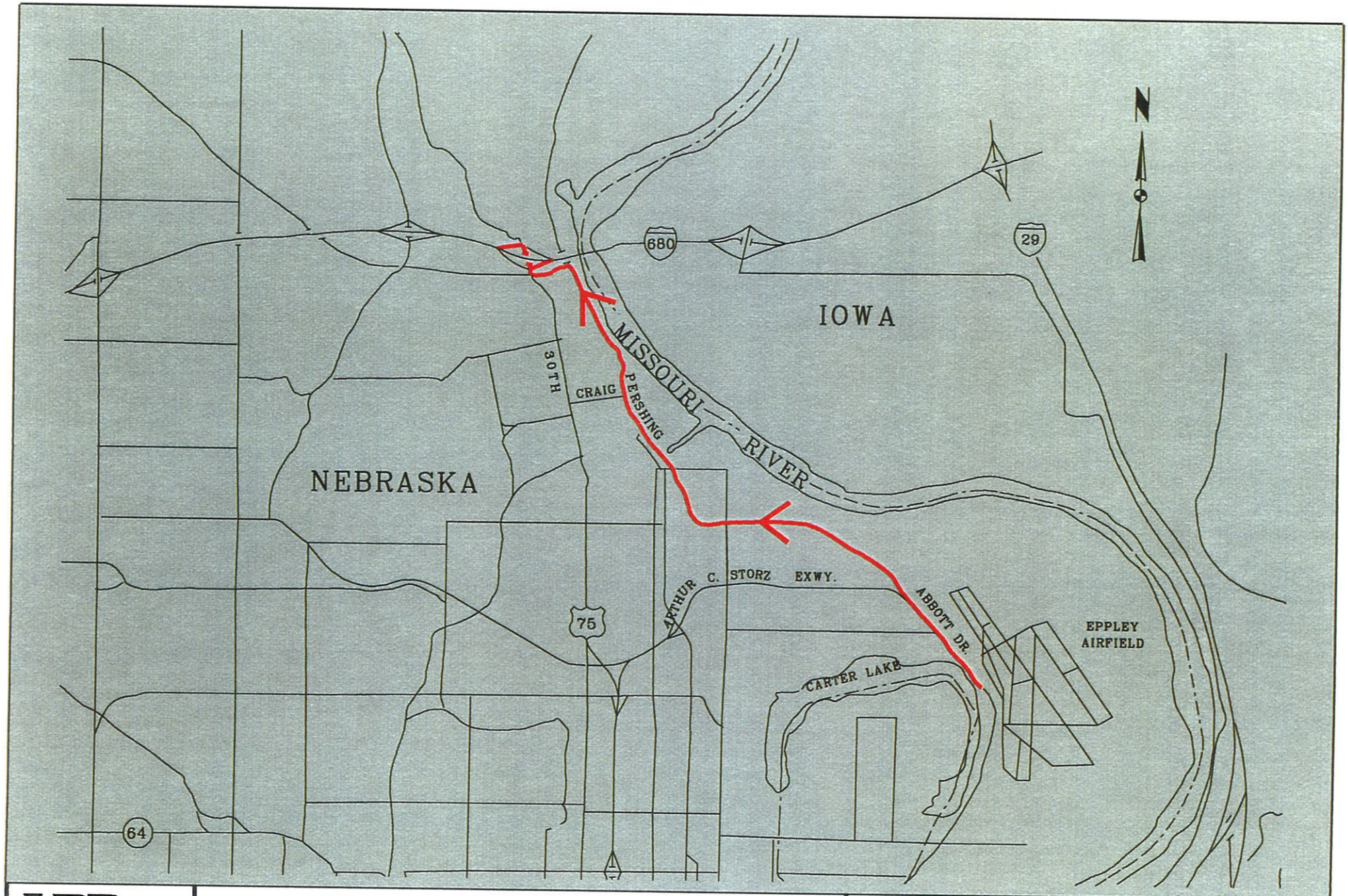
EXISTING SIGNED ROUTES TO EPPLEY AIRFIELD

EXHIBIT 2–1



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EXISTING SIGNED ROUTES FROM EPPLEY AIRFIELD TO I–680

EXHIBIT
2–2

EXISTING RAILROADS

Union Pacific Rail Road (UPRR) maintains active spur tracks throughout the study corridor that serve OPPD (coal), MUD (chlorine) and various other industries (miscellaneous supplies). Both MUD and OPPD have plans to maintain the ability to ship and receive bulk commodities through rail service. For purposes of this study, all rail lines were assumed to remain active.

LAND USE/SOCIOECONOMIC

Northeast Omaha, between I-680 and Eppley Airfield, encompasses several land use patterns. The 30th Street corridor is primarily comprised of single-unit households mixed with small retail-oriented businesses concentrated within several business districts. The northeast Omaha neighborhood of Florence is probably the most recognized neighborhood within the study corridor due to its historical significance.

The industrial area just northwest of Eppley Airfield has grown significantly in the past twenty years. The industrial area businesses include manufacturing, wholesalers, major distributors, recycling operations, company corporate headquarters, and personal service companies. The industrial area generates semi-tractor trailer and single-unit truck traffic throughout all periods of the day.

Several open spaces exist within the corridor for various recreation uses such as softball, baseball, soccer, rugby, and general recreational. These areas can generate pedestrian traffic comprised mainly of younger age children.

EXISTING TRAFFIC VOLUMES

Corridor traffic volumes were developed from the City of Omaha traffic counts and MAPA traffic flow maps. The collected data consisted of both daily link volumes and peak hour intersection turning movement counts. Most intersections in the study area were counted during the base year (1998). Those intersections not counted during the base year but that had been counted within the past three years were adjusted to the base year using a growth rate of 3 percent per year. This growth rate was consistent with MAPA findings for this area. Overall, counts were obtained at 19 intersections within the study area.

DEFINITION OF LEVEL OF SERVICE

As a means of describing the operational efficiency of a given roadway segment or intersection, the range of service quality has been defined in terms of six descriptive service levels. These levels are described in Table 2-1. Level of service (LOS) "C" is generally used in the Omaha metropolitan area as the standard for planning of transportation facilities for peak hour traffic conditions. However, LOS "D" is often accepted in highly urbanized areas where the cost or impacts to provide LOS "C" is prohibitive. In the remainder of this report, LOS "D" or better is considered acceptable.

Table 2-1 Level of Service Description

Level of Service	Intersection Stopped Delay (sec/veh)	Intersection Level of Service Description	Arterial Level of Service Description
A	≤ 5.00	Free Flow, Insignificant Delays. No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication.	Primarily free-flow operations at average travel speeds. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream.
B	5.1-15.0	Stable Operation, Minimal Delays. An occasional approach phase is fully utilized. Many drivers begin to feel somewhat restricted within platoons of vehicles.	Reasonably unimpeded operations at average travel speed. Ability to maneuver within the traffic stream is only slightly restricted and stopped delays are not bothersome.
C	15.1-25.0	Stable Operation, Acceptable delays. Major approach phases fully utilized. Most drivers feel somewhat restricted.	Represents stable operations. Ability to maneuver and change lanes in midblock locations may be more restricted.
D	25.1-40.0	Restricted flow, regular delays. Drivers may have to wait through more than one red signal indication. Queues may develop but dissipate rapidly, without excessive delays.	Borders on a range in which small increases in flow may cause substantial increases in delay and decreases in arterial speed. Average speeds are about 40% of free-flow speed.
E	40.1-60.0	Maximum capacity, extended delays. Volumes at or near capacity. Vehicles may wait through several signal cycles. Long queues form upstream from intersection.	Characterized by significant delays and average travel speeds of one-third the free-flow speed or less.
F	> 60.0	Forced flow, excessive delays. Represents jammed conditions. Intersection operates below capacity with low volumes. Queues may block upstream intersections.	Characterizes arterial flow at extremely low speeds below one-third to one-fourth of the free-flow speed. Intersection congestion is likely at signalized locations.

Source: 1994 Highway Capacity Manual, Transportation Research Board.

EXISTING ROADWAY SEGMENT LEVEL OF SERVICE

Roadways within the study corridor were divided into twelve key roadway segments based on number of lanes and other characteristics such as access control. Segmenting the corridor roadways provided a means to breakdown the corridor operations into manageable pieces for detailed review. Segment capacities were developed by HDR based on national research and adjusted for local conditions. Segment level-of-service was determined by the ratio of demand or volume (ADT) to capacity. Table 2-2 summarizes the roadway segment level of service analysis for existing conditions.

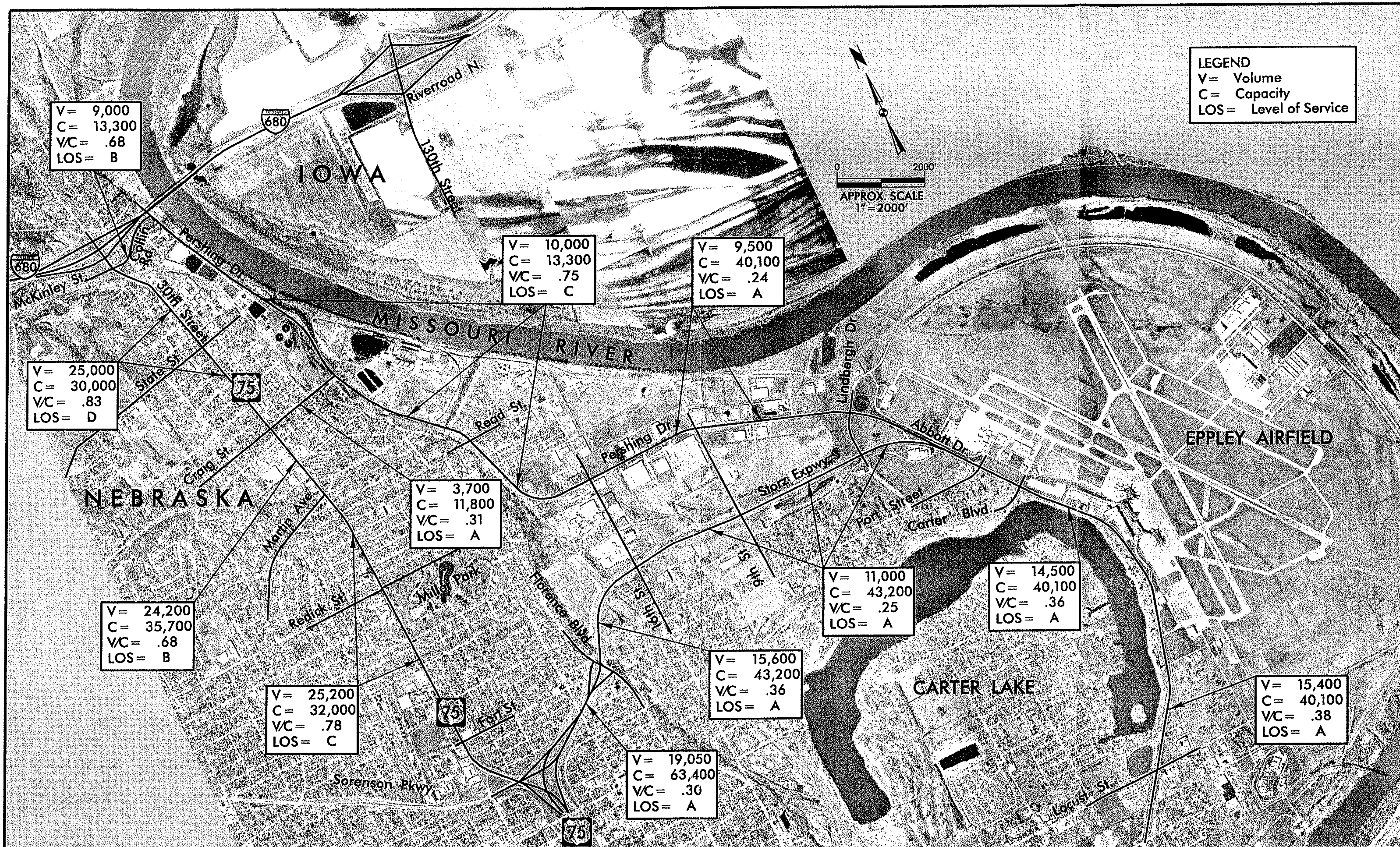
Table 2-2 Roadway Segment Analysis Summary - Existing Conditions

SEGMENT	EXISTING		
	ADT	CAPACITY	LOS
Storz Expressway (North Freeway (US 75) to Florence Boulevard)	19,050	63,400	A
Storz Expressway (Florence Boulevard to 16th Street)	15,600	43,200	A
Storz Expressway (16th Street to Abbott Drive)	11,000	43,200	A
30th Street (Dick Collins Road to Craig Street)	25,000	30,000	D
30th Street (Craig Street to Martin Avenue)	24,200	35,700	B
30th Street (Martin Avenue to Storz Expressway)	25,200	32,000	C
Dick Collins Road (30th/31st Street to Pershing Dr)	9,000	13,300	B
Pershing Drive (Dick Collins Road to 16th Street)	10,000	13,300	C
Pershing Drive (16th Street to Abbott Drive)	9,500	40,100	A
Abbott Drive (Storz Expressway to Airport entrance)	14,500	40,100	A
Craig Street (30th Street to Pershing Drive)	3,700	11,800	A
Abbott Drive (South of Airport entrance)	15,400	40,100	A

As indicated in Table 2-2, segment operations within the study corridor are generally acceptable with the exception of the Florence area of 30th Street, which is at LOS D. Figure 2-3 graphically illustrates the existing segment LOS and daily volumes for the major roadways in the study area.

EXISTING INTERSECTION LEVEL OF SERVICE

Twelve key intersections along the study corridor were analyzed to determine the current level of service at key junctions. The LOS at individual intersections is based on a more detailed analysis than for the roadway segments. Thus, intersection LOS is generally considered to be the best indicator of the level traffic service being provided in a roadway system. The PM (afternoon) peak hour was used in the analysis. Existing intersection LOS analysis was performed using the Synchro software (version 3.2) for signalized intersections and the Highway Capacity Software (HCS) for unsignalized intersections. Table 2-3 summarizes the intersection level of service analysis for existing conditions.



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EXISTING SEGMENT VOLUMES AND LOS

EXHIBIT 2–3

Table 2-3 Intersection Analysis Summary – Existing Conditions (PM Peak Hour)

INTERSECTION	EXISTING LOS
30th Street & Dick Collins Road	C
30th Street & State Street	C
30th Street & Craig Street	A
30th Street & Redick Avenue	B
30th Street & Fort Street	C
Storz Expressway & 16th Street	B
Storz Expressway & 9th Street	A
Storz Expressway & Abbott Drive	B
Pershing Drive & 16th Street	B
Pershing Drive and Read Street	B
Pershing Drive & Craig Street	A
Pershing Drive & Dick Collins Road	B

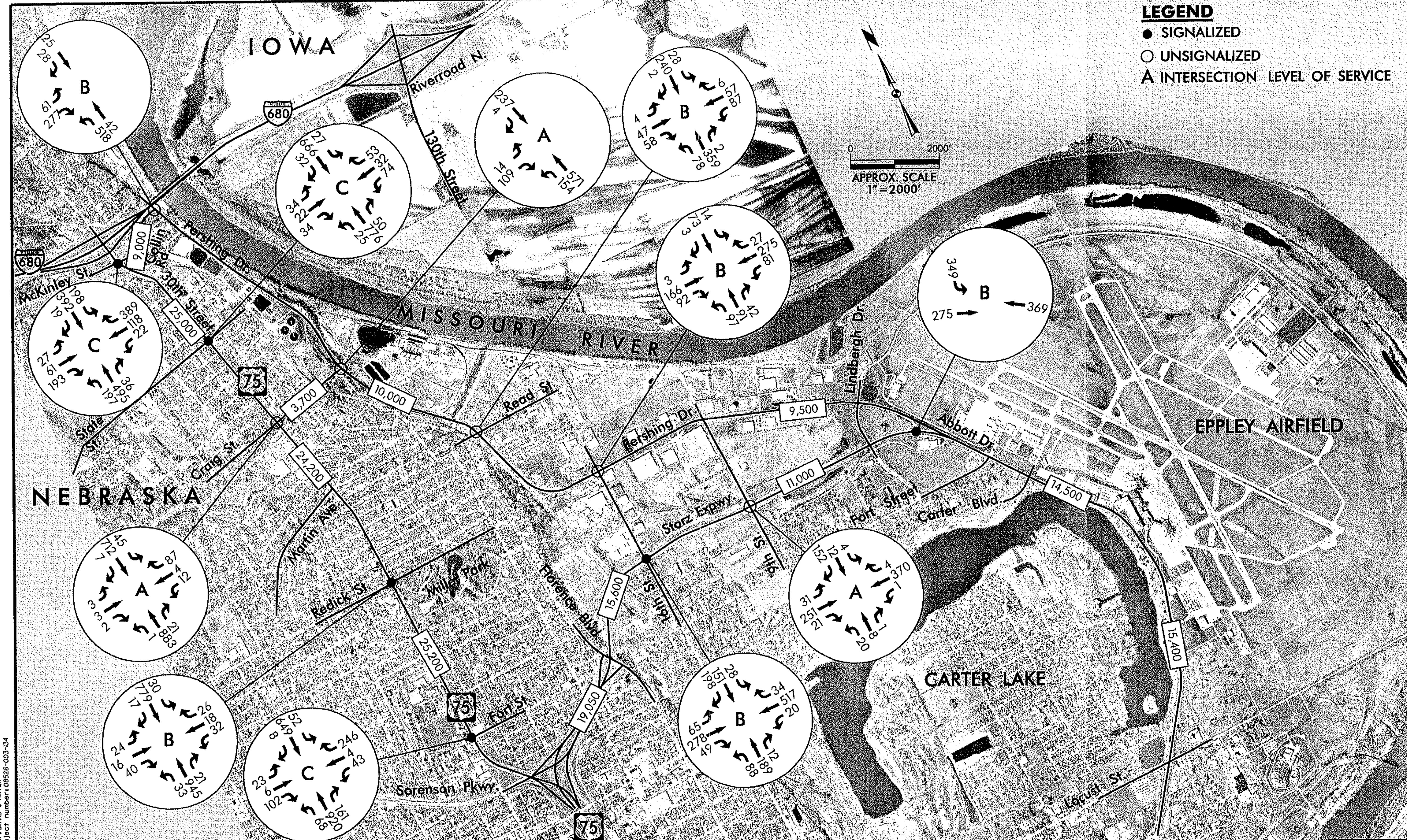
As indicated in Table 2-3, intersection operations within the study corridor are generally acceptable. Figure 2-4 graphically illustrates the existing intersection LOS and intersection turning movement volumes for the key intersections in the study area.

TRAVEL TIME ANALYSES

Travel time runs were performed for the I-680 and I-29 corridors leading to Eppley Airfield. Travel time runs are used as a means of qualifying traffic service to supplement typical measures of congestion such as level of service. MAPA provided travel time data for the I-680 to Eppley Airfield corridor using Global Positioning System (GPS) techniques. HDR supplemented the MAPA data with additional travel time runs using a stopwatch technique. The travel times were collected at various times of the day and are not necessarily representative of peak traffic conditions. Figure 2-4 illustrates the routes for which travel times were measured and/or estimated. The routes represent alternative paths for travel between the following end points:

- Between the I-680/30th Street Interchange and Eppley Airfield
- Between the I-29/I-680 Interchange and Eppley Airfield

Table 2-4 summaries the average travel times for four routes between the I-680/30th Street interchange and Eppley Airfield. These routes begin at the I-680 exit ramps and end at the entrance to Eppley Airfield.



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I – 680 TO EPPLEY AIRFIELD CORRIDOR STUDY

EXISTING INTERSECTION VOLUMES AND LOS

EXHIBIT 2–4

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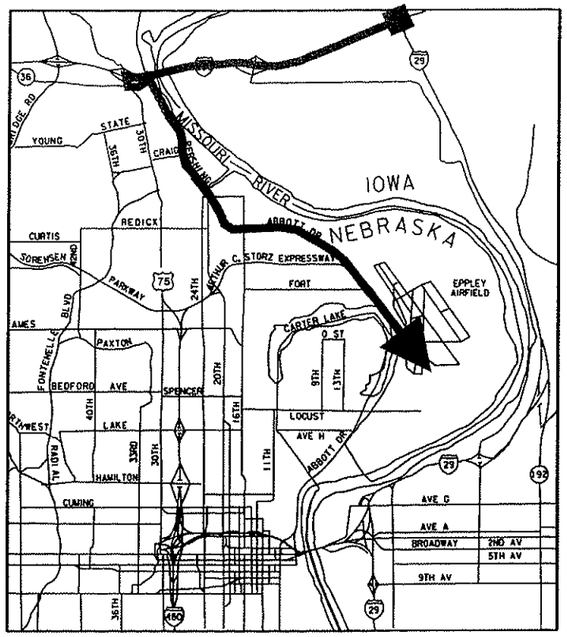
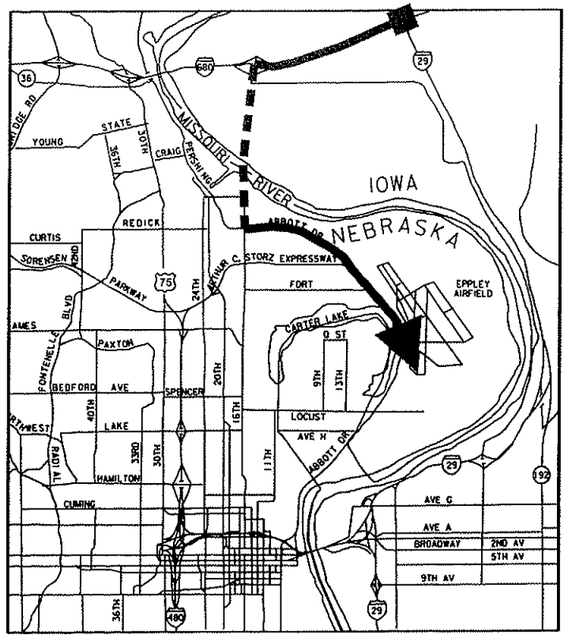
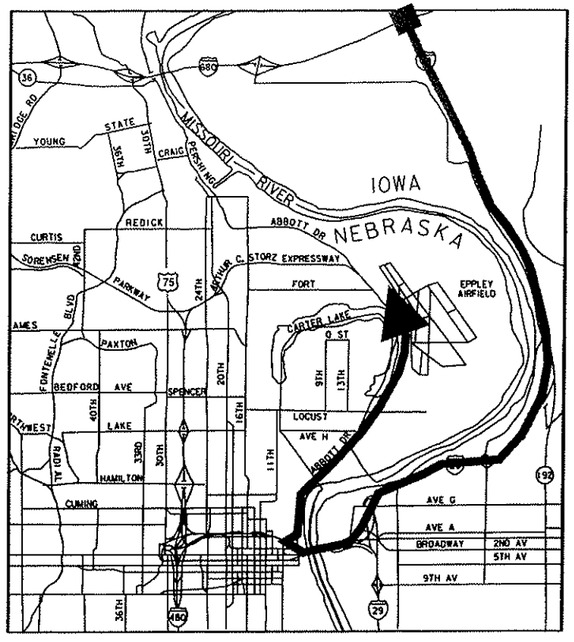
Project number: 08526-003-134



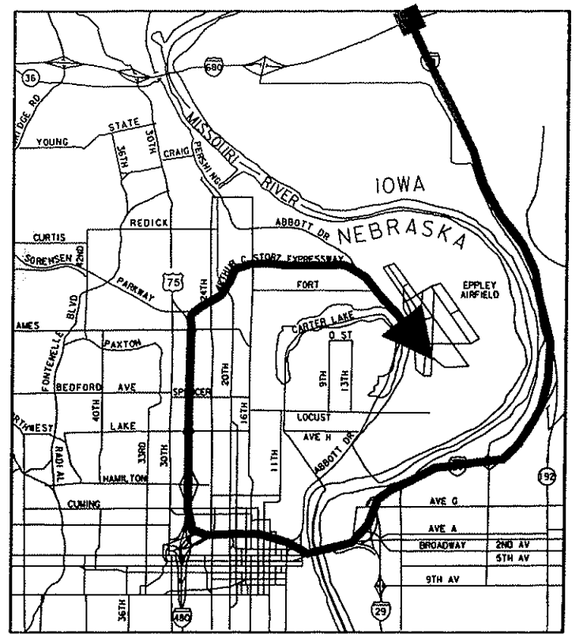
I-29 / I-680 Route 1 (12:20)



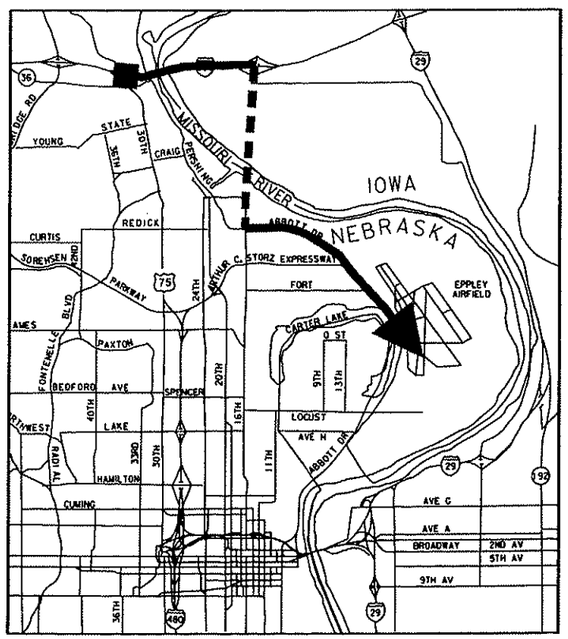
I-29 / I-680 Route 2 (8:06)



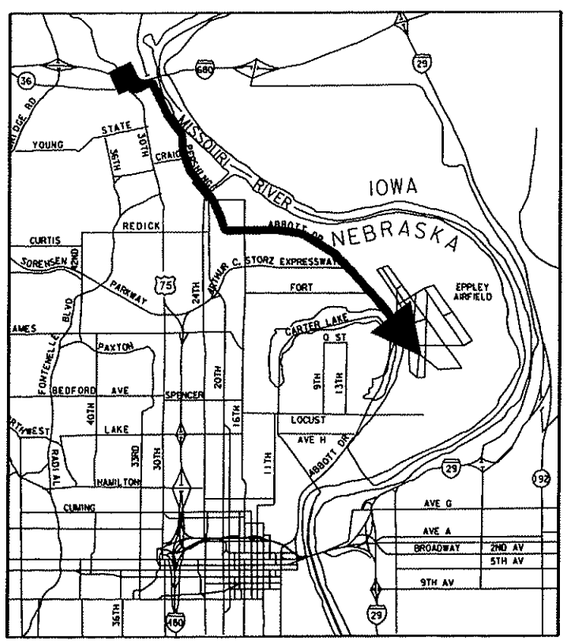
I-29 / I-680 Route 3 (12:48)



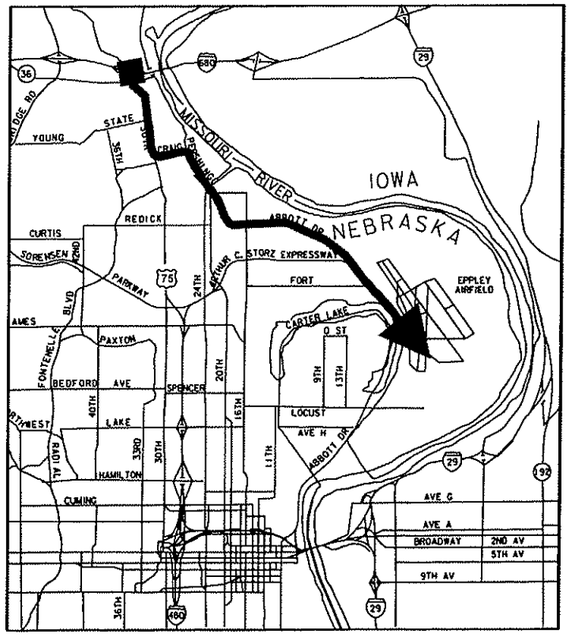
I-29 / I-680 Route 4 (18:28)



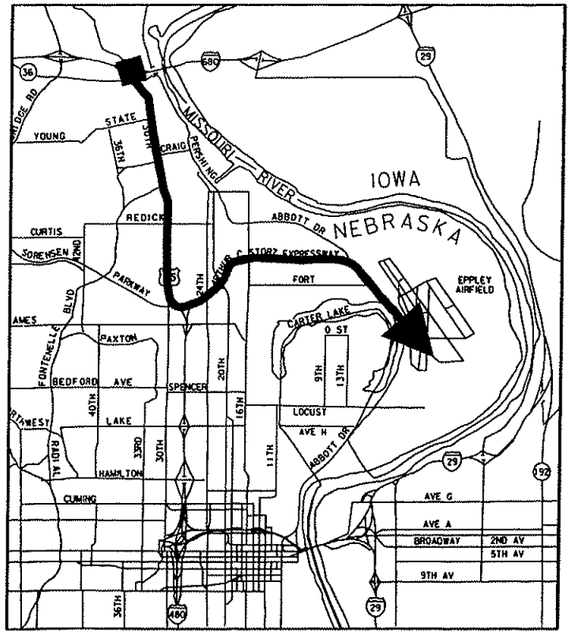
I-680 / 30th St. Route 1 (8:07)



I-680 / 30th St. Route 2 (8:37)



I-680 / 30th St. Route 3 (9:52)



I-680 / 30th St. Route 4 (10:46)

HDR Engineering, Inc.	Metropolitan Area Planning Agency I-680 TO EPPLEY AIRFIELD CORRIDOR STUDY	Existing / Estimated Route Travel Times (1998 Base Year)

EXHIBIT 2-5

Table 2-4 Travel Times Between I-680/30th Street Interchange and Eppley Airfield

Route Description	Average Travel Time (min.)
30th Street to Storz Expressway to Abbott Drive	10:46
30th Street to Craig Street to Pershing Drive to Abbott Drive	9:52
30th Street to Dick Collins Road to Pershing Drive to Abbott Drive	8:37
30th Street to I-680 Interchange 1 in Iowa to 16th Street (via the proposed river crossing) to Pershing Drive to Storz Expressway to Abbott Drive*	8:07

*Route includes proposed roadways. Travel time estimated for these roadways using an average travel speed of 50 mph.

Table 2-5 summarizes the average travel times for four routes between the I-29/I-680 system interchange and Eppley Airfield. These routes begin at the I-29 exit ramp to I-680 and end at the entrance to Eppley Airfield.

Table 2-5 Travel Times Between I-29/I-680 Interchange and Eppley Airfield

Route Description	Average Travel Time (min.)
I-29 to I-480 to Abbott Drive	12:48
I-29 to I-480 to North Freeway to Storz Expressway to Abbott Drive	18:28
I-29 to I-680 Interchange 1 in Iowa to 16th Street (via the proposed river crossing) to Pershing Drive to Storz Expressway to Abbott Drive*	8:06
1-29 to I-680 to 30th Street to Storz Expressway to Abbott Drive	12:20

* Route includes proposed roadways. Travel time estimated for these roadways using an average travel speed of 50 mph.

As will become apparent in the development and analysis of long term improvements, the desirability of a river crossing became evident as the limitations imposed by existing routes were identified. As such the travel time runs included a calculation of an assumed river crossing.

The travel time runs indicate that a new river crossing in the vicinity of Interchange 1 in Iowa and 16th Street would provide the quickest route to Eppley Airfield from both of the I-29 and I-680 origins that were assessed. Future route travel times are difficult to predict. However, it is reasonable to assume that travel times on existing routes would increase in response to growing congestion, whereas a river crossing route would remain relatively constant.

EXISTING CONDITIONS SUMMARY

The following are the key points identified through the existing conditions analysis:

- Although the exiting route is confusing and cumbersome to unfamiliar drivers, technical capacity problems do not exist.
- The existing railroad tracks are active and the users have no plans to abandon them.
- The potential travel time benefits for vehicles accessing the airport from Iowa are 33% or slightly over 4 minutes.
- The potential travel time benefits for vehicles accessing the airport from Nebraska via I-680 are 7% or about 30 seconds. It should be noted that this difference will grow as congestion increases on the existing route.

CHAPTER 3: TRAVEL SURVEYS

During the conduct of this study, various travel surveys were conducted to provide information regarding current users of the corridor as well as information to be used in the development of traffic forecasts. These included an origin-destination survey, a mail-out survey of businesses in the vicinity of the Eppley Airfield and a license-plate survey of vehicles parked overnight in the parking facilities at Eppley Airfield.

ORIGIN-DESTINATION STUDY

An origin-destination study was conducted for the I-680 to Eppley Airfield corridor on September 18, 1998. The purpose for this study was to determine to number of trips from I-680 north of Omaha to Eppley Airfield and the industrial area in the vicinity of Eppley Airfield.

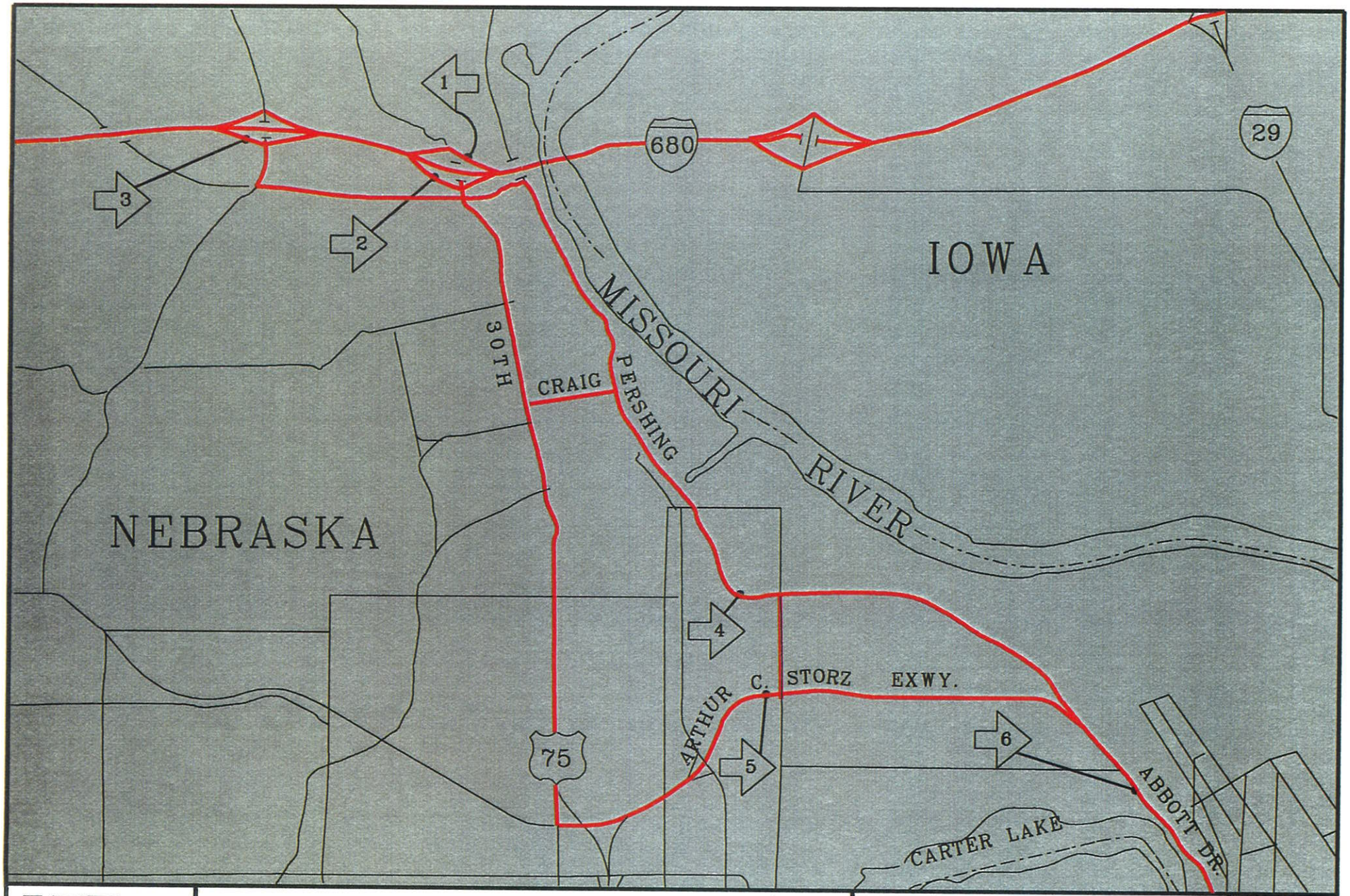
The following procedure outlines the methodology used to determine the number of trips originating from I-680 and destined for Eppley Airfield.

1. Six data collection stations were utilized to obtain license plate information. These stations are shown in Exhibit 3-1. The data collection stations were located as follows: Station # 1 on the I-680 WB exit ramp at 30th street, Station # 2 on the I-680 EB exit ramp at 30th street, Station # 3 on the I-680 EB exit ramp at 42nd street, Station # 4 on Pershing Drive just west of 16th Street, Station # 5 on Storz Expressway just west of 16th Street, and Station # 6 on Abbott Drive just south of Fort Street.

   Three peak periods were sampled {AM (6:30-10:00), Noon (11:00-2:00), and PM (3:00-6:30)} for a total of 10 hours of data. A total of 16,490 license plates were recorded along with the time, vehicle type (car or truck), and state (NE, IA, SD, or other). These data were then manually entered into a spreadsheet program for ease of manipulation and plate matching.

2. The spreadsheet was programmed to truncate, sort, and match single-leg trips (example: Station 1 to Station 4) and double-leg trips (example: Station 1 to Station 4 to Station 6) based on the license plate. The program was developed to match plates within a period of 45 minutes to eliminate trips that included multiple intermediate stops and delay. For example, an origin at 8:00 AM that matched to a destination at 2:00 PM was not considered a trip.

3. Field personnel were required to identify and record all license plates. The field data was then manually transcribed it into the spreadsheet. Since, this procedure inherently contains human error an adjustment factor of 15 % was used to adjust the matrices upward.



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I – 680 TO EPPLEY AIRFIELD CORRIDOR STUDY

O–D SURVEY STATIONS

EXHIBIT 3–1

4. Tube counts were also collected at each of the data stations. The data collection team achieved a capture rate of 84 percent, calculated by dividing the number of license plates collected to the number of vehicles recorded by the counting equipment. This capture rate is consistent with previous studies conducted by HDR.

5. The trip matrices were further adjusted for capture rate and to project the trips over a 24-hour period. Tube counts obtained were used to factor the data up to account for the capture rate being less than 100%. ADT was used to adjust the trip matrices to a 24-hour matrix.

6. To ensure the accuracy of the preceding methodology, a Fratar model was used to determine the final trip matrices. Both methodologies were cross-referenced to ensure accuracy of reported information.

7. The final number of trips originating from I-680 and destined for Eppley Airfield are presented in Table 3-1 and 3-2 for single-leg and double-leg trips, respectively.

Table 3-1 Final O-D License Plate Matching Program Results, Single Leg Trips

		Destination Stations		
		4	5	6
Origin Stations	1	403	25	275
	2	1313	124	812
	3	82	69	74
	4	--	--	1382
	5	--	--	1261

Table 3-2 Final O-D License Plate Matching Program Results, Double Leg Trips

Trip Stations	Trips
1-4-6	217
1-5-6	2
2-4-6	551
2-5-6	23
3-4-6	33
3-5-6	12

Based on the results of the origin-destination survey, the total number of vehicles traveling between I-680 and the Eppley Airfield area (one-way only) is estimated to be approximately 2,000 vehicles per day (vpd). Of these 2,000 vehicles, approximately 850 vpd are destined for the industrial area while approximately 1,150 vpd are destined for the Eppley Airfield (i.e., terminal building, parking facilities, etc.). From these the total

two-way traffic volume between I-680 and the Eppley Airfield area is estimated to be approximately 4,000 vpd. Figure 3-2 summarizes the results of the O/D study.

MAIL OUT SURVEY

A trucking operations questionnaire was sent to businesses in the industrial area near Eppley Airfield during the last week of September 1998. A blank form is shown in Exhibit 3-3. The purpose of the questionnaire was to:

- determine the number of trucks operating within the industrial area
- determine the times at which trucks operate in this area
- determine the routes that the trucks use; and
- offer businesses an opportunity to provide input to the study regarding the need for future improvements to the area.

A total of 34 businesses were identified and sent questionnaires, of which 24 were completed and returned for a response rate of 71 percent. Nearly all of the responses provided information regarding their truck operations. Although difficult to summarize statistically, this information was utilized in support of traffic forecasting activities. Of the completed questionnaires, 66 percent provided a response to the question regarding the need for improvements in the study area.

- 61% (8 responses) suggested that widening and/or improving existing routes would benefit their operations.
- 31% (4 responses) suggested that a new and direct route from I-680 to the industrial area should be built.
- 8% (1 response) suggested that improved signing would benefit their operations.

EPPLEY AIRFIELD PARKING SURVEY

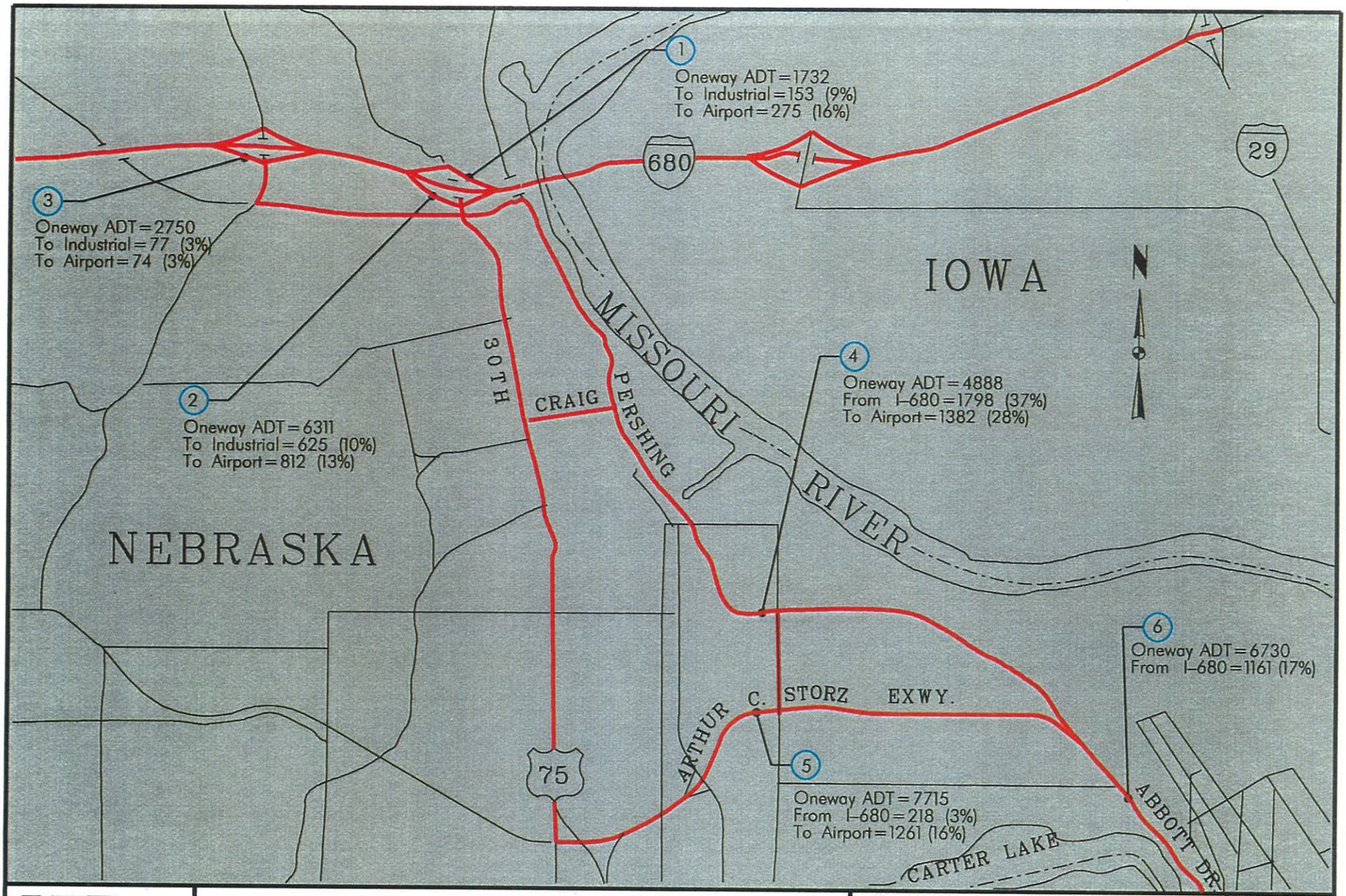
A review of the parking system inventory at Eppley Airfield was conducted to determine the characteristics of the parking system users at Eppley Airfield (excluding privately-owned lots). This information was utilized in the development of assumptions regarding the number of drivers destined to Eppley Airfield from the north.

Parking data was provided by the Omaha Airport Authority (OAA) from parking lot inventories recorded on five days in 1998: August 6 (Thursday), August 21 (Friday), September 17 (Thursday), October 20 (Tuesday) and October 21 (Wednesday). For each day, the data was recorded after midnight as a means of capturing overnight users. Exhibit 3-4 summarizes the percent of parking facility users by state using the average of the five days of data.

TRAVEL SURVEY SUMMARY

The following are the key points identified through the travel summary analysis:

- The demand to the airport / industrial area from I-680 is about 4,000 vehicles per day which represents 40% of the volume on Pershing Drive.
- 34 businesses exist in the industrial area. 66% felt that improvements were needed.
- 1 out 4 vehicles parked at Eppley Airfield are from outside Nebraska.



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I – 680 TO EPPLEY AIRFIELD CORRIDOR STUDY

O–D SURVEY RESULTS

EXHIBIT **3–2**

Exhibit 3-3 Trucking Operations Survey Form

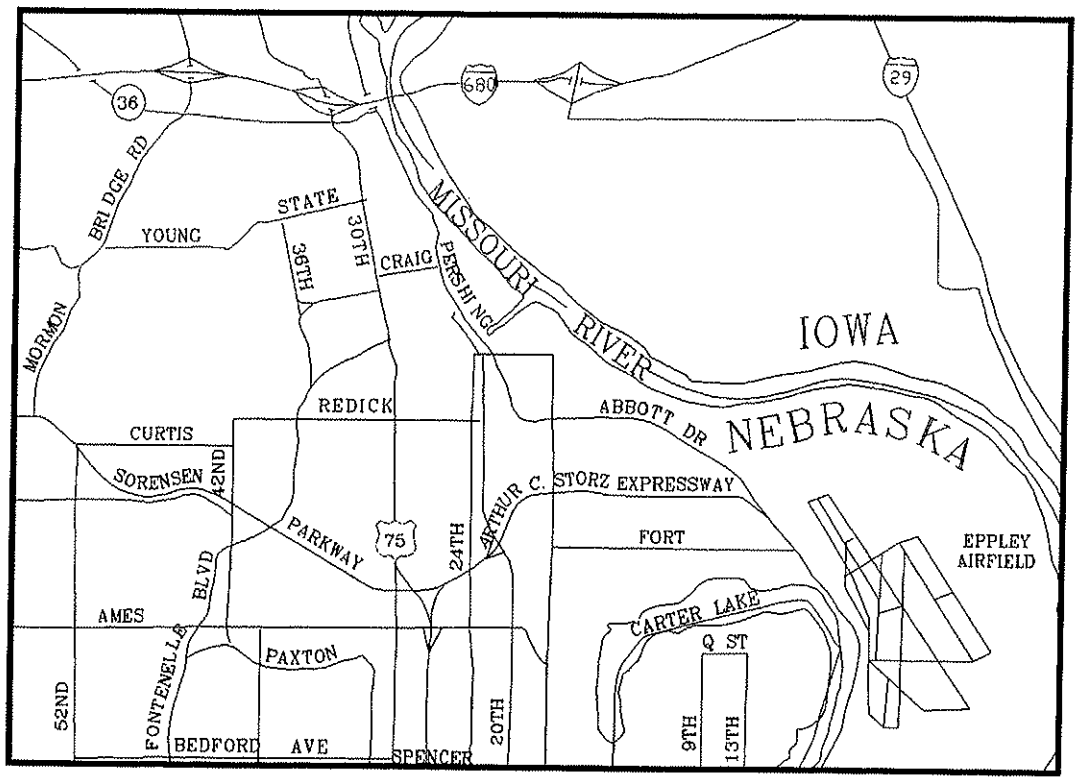
Company name:
Name of the person responding to questionnaire:
Telephone number:
Address:

1. Describe the number and type of trucks that arrive/depart your facility in a typical day. (Example: # of tractor-trailers, # of three-axle straight trucks, etc.)

2. What hours of the day do trucks arrive or depart the most? Do truck operations vary by day of the week or season?

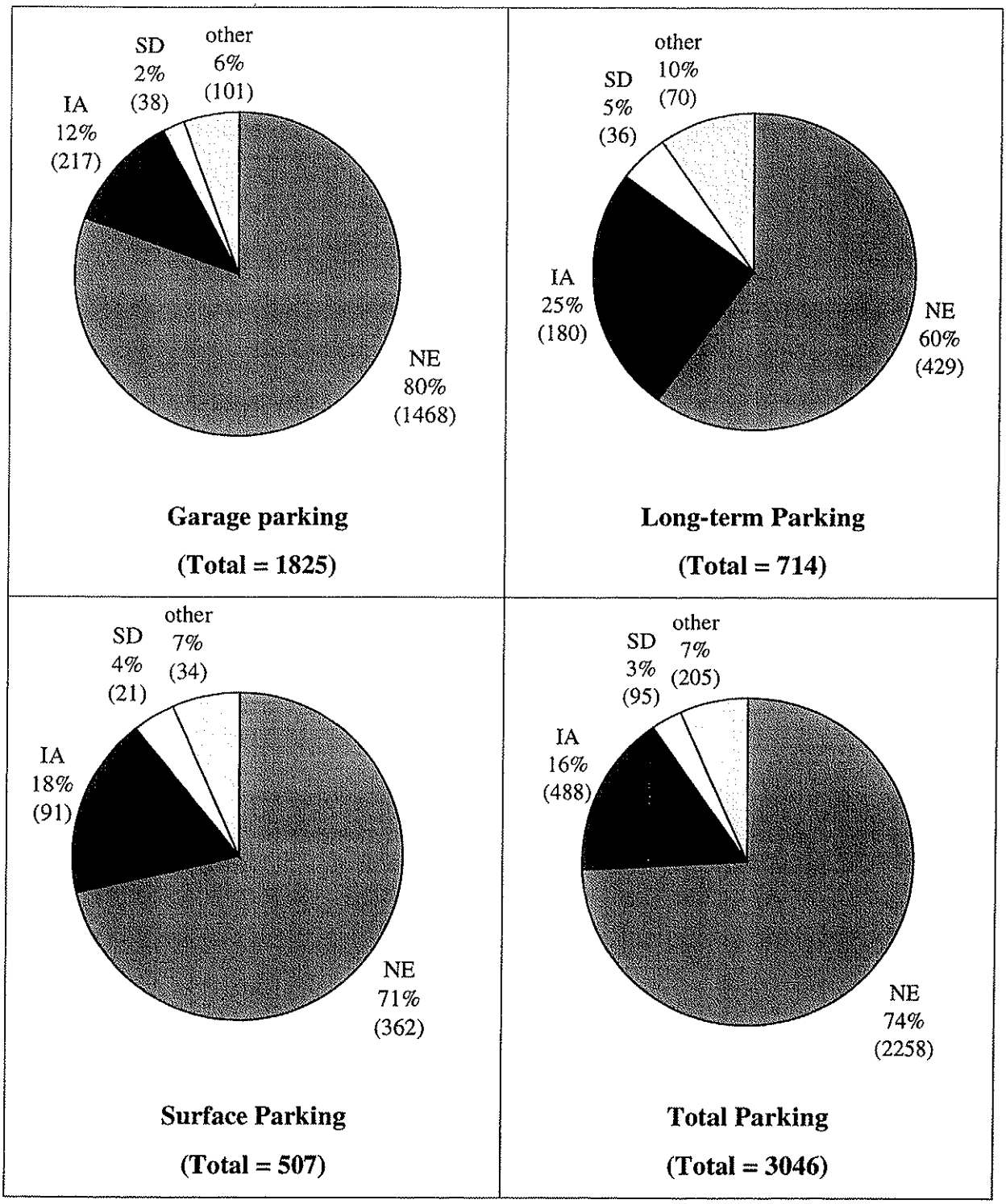
3. Of the trucks using I-680 to reach or leave your business, what percentage:
   - Use Abbott Road ___
   - Use Storz Expressway ___
   - Use another route (please identify) ___

4. What improvements to the roadway system in this area would benefit your operations? Use the map below as necessary.



5. Please use the back of this form to provide any additional comments.

Exhibit 3-4 Summary of Overnight Parking at Eppley Airfield



CHAPTER 4: FUTURE CONDITIONS

EPPLEY AIRFIELD MASTER PLAN

An update to the 1990 Master Plan for Eppley Airfield was completed in 1997. The Master Plan provides a step-by-step or phased outline for further development of Eppley Airfield and gives OAA advance notice of pending needs to aid in future scheduling and budgeting. In recognition of the cyclical nature of the aviation industry, the Master Plan was developed to be demand-based rather than time-based. In this way, Eppley Airfield will continue to provide the Omaha region with a safe and efficient airport while being improved and expanded in a cost efficient manner.

Since 1990, Eppley Airfield has seen significant increases in air passenger and air cargo activity. The entry of several new carriers into the Omaha market has increased the frequency of service and available destinations as well as lowered air fares. Air cargo activity has continued to grow well beyond previous projections. This growth was a key element in the development of the forecast planning horizons included in the 1997 Master Plan for Eppley Airfield. The planning horizons are summarized in Table 4-1.

Table 4-1 Eppley Airfield Planning Horizons

Activity	Actual 1996	Short Term	Intermediate Term	Long Range
Annual Operations	162,418	193,500	211,100	240,000
Annual Enplanements	1,777,288	2,500,000	3,100,000	4,000,000
Air Cargo	229,110	327,000	430,000	700,000
Based Aircraft	121	127	131	140

Source: Airport Master Plan for Omaha Eppley Airfield, Coffman Associates, Inc., April 1997

Although the above forecasts are not necessarily time-based, the long range horizon generally represents the forecasted level of activity in the Year 2015. Thus, enplanements are expected to increase approximately 125 percent in less than twenty years, or at an average rate of approximately 4.4 percent per year. This forecasted growth served as the basis for the modifications that were made to the MAPA regional travel demand model for this study. This effort is described in a later section of this report.

The Master Plan also includes an updated Airport Layout Plan that summarizes numerous proposed improvements over the next twenty years. A key element of this plan is the construction a new South Terminal. The new terminal would be accompanied by new parking facilities and a new terminal roadway system. The plan also includes the widening of Abbott Drive to six lanes in the vicinity of the airport.

PROGRAMMED AND PLANNED ROADWAY IMPROVEMENTS

A review of programmed and planned roadway improvements in the study area was conducted. Programmed improvements were identified through a review of MAPA's

Transportation Improvement Program (TIP) for fiscal years 1999-2004. Although a number of projects within the study area are included in the TIP, none of these improvements are expected to have a major impact on travel between I-680 and Eppley Airfield. The projects include:

- Miscellaneous improvements at Eppley Airfield ***not*** related to vehicle access or circulation (e.g., runway or taxiway improvements)
- Maintenance activities on the I-680 bridge over the Missouri River.
- Deck overlay for I-680 bridges over 30th Street.
- Widening of Ames Avenue between 28th Street and 31st Street to provide left turn lanes on Ames Avenue.
- Design and construction of the Missouri River Trail between Asarco and NP Dodge Park.

Proposed long range improvements beyond the TIP were identified through a review of the Street and Highway System Plan element of MAPA's Year 2020 Interim Long Range Transportation Plan (LRTP). Within the study area, two improvements were identified:

- Widening of I-680 to six lanes between Maple Street and the Missouri River.

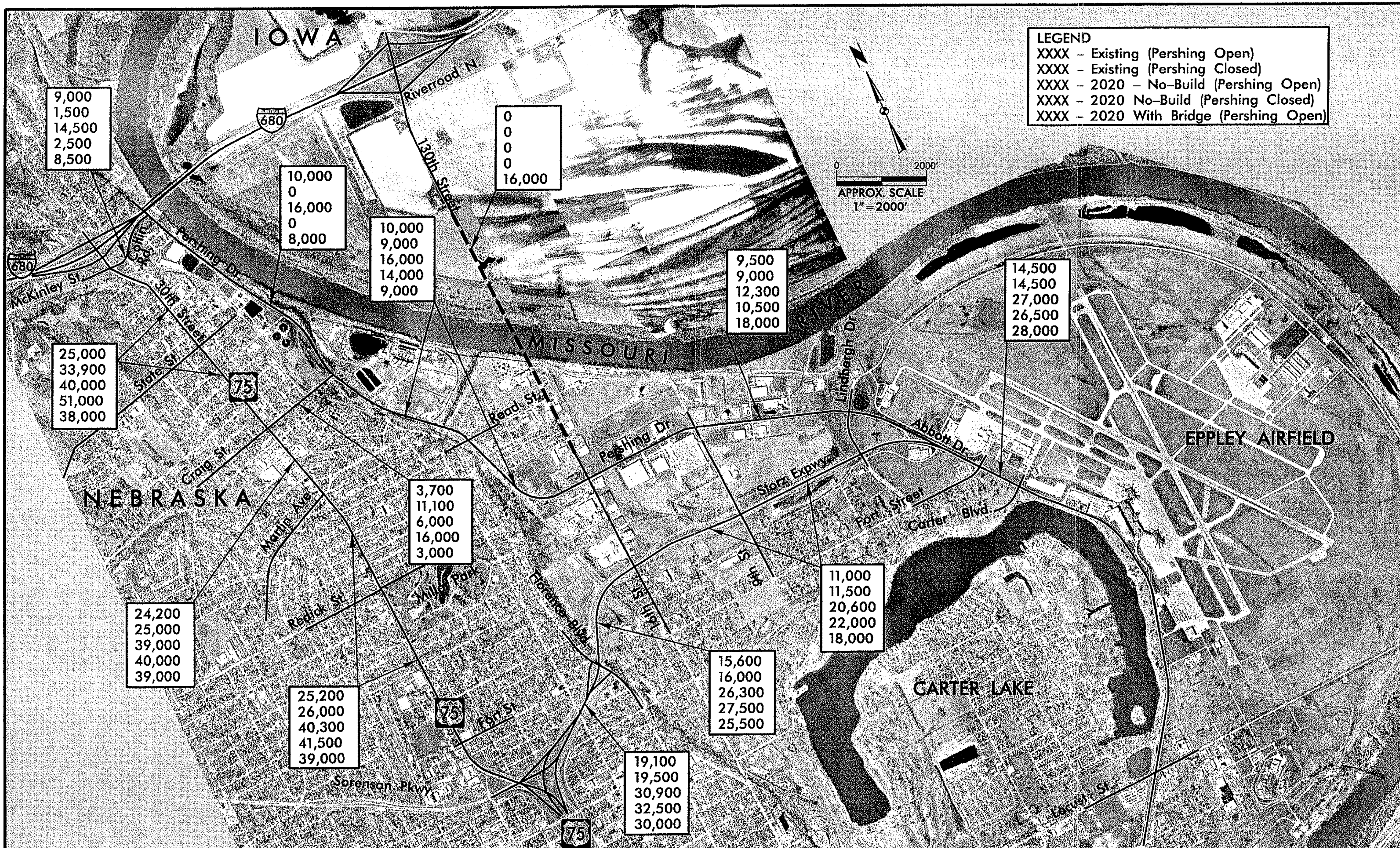
- A new 4-lane connection from I-680 to the Storz Expressway. This connector would generally follow the alignment of an existing UPRR spur. However, this track is currently in use and there are no immediate plans by MUD to cease rail shipments. As described in Chapter 5 of this report, this proposal would also be physically difficult to construct where the new roadway would connect at the Storz Expressway and at the 30th Street / I-680 interchange. MAPA recognizes these complications but has retained the connection in the LRTP as documentation of the need for an improved connection between I-680 and Eppley Airfield. It is expected that the LRTP will be revised to reflect the findings of this study.

YEAR 2020 TRAFFIC FORECASTS

Year 2020 traffic forecasts for the study area were developed jointly by HDR and MAPA utilizing MAPA's regional travel demand forecasting model. To aid in the development and assessment of study alternatives, forecasts were developed for the following scenarios:

- Year 2020 No-Build (LRTP without the new connection between I-680 and Storz Expressway) ***and*** with Pershing Drive ***open*** at MUD.
- Year 2020 No-Build (LRTP without the new connection between I-680 and Storz Expressway) ***and*** with Pershing Drive ***closed*** at MUD.
- Year 2020 with a new bridge connecting I-680 and Pershing Drive on the alignment of 16th Street ***and*** with Pershing Drive ***open*** at MUD.

Exhibit 4-1 summarizes the Year 2020 traffic forecasts (daily volumes) for key links in the study area for the above scenarios. For comparison purposes, Exhibit 4-1 also includes existing daily traffic volumes and the estimated existing daily traffic volumes



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TRAFFIC VOLUMES (ADT) WITH / WITHOUT PERSHING DR.

EXHIBIT
4–1

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User: DAVID J RAYER
Project number: 08526-003-134

assuming closure of Pershing Drive at MUD (i.e., What happens to traffic volumes in Pershing Drive were to be closed tomorrow?).

Note that the forecasts shown in Exhibit 4-1 do not necessarily reflect raw output from MAPA's regional model. Rather, the forecasts represent adjusted volumes based on model output, historical traffic patterns and engineering judgement. Key to this process was the development of Year 2020 forecasts for the No-Build scenario. The methodology employed in the development of Year 2020 No-Build forecasts is summarized below.

- Regional model input files were obtained from MAPA for the 1992 base year calibration model and the 2020 model. Both models currently include delay penalties to replicate the effect that the Missouri River and Iowa-Nebraska border have on travel between Omaha and Council Bluffs. For this study, these penalties were retained for existing river crossings but not applied to a new river crossing between I-680 and Eppley Airfield.

- Relative and absolute correction factors were developed for each of the network links within the study area based on the deviation observed between the 1992 Base assignments and the 1992 ADT obtained from the 1992 MAPA flow map.

- These factors were applied to the Year 2020 No-Build assignments. A single Year 2020 forecast was then developed for each link by averaging the results from each of the two correction factors.

Peak-hour forecasts (PM peak hour only) were then developed for the Year 2020 No-Build scenario. The peak-hour forecasts were developed for the same key intersections identified in the assessment of existing conditions by applying existing traffic characteristics such as peak hour factors, directional splits and turn percentages to the Year 2020 daily volume forecasts.

Observations of the Project Team regarding traffic forecasts for the study area are summarized below.

- If Pershing Drive were to be closed tomorrow, most of the traffic currently on Pershing Drive would be expected to divert to 30th Street. Traffic volumes on 30th Street would approach capacity immediately.
- Compared to existing traffic volumes, Year 2020 No-Build forecasts (with Pershing Drive open) reflect an annual growth rate of between two and three percent per year. Year 2020 No-Build forecasts for 30th Street exceed the capacity of the existing facility.
- With Pershing Drive closed and no other improvements in the study area, Year 2020 traffic forecasts for 30th Street will greatly exceed the capacity of the existing facility.
- A new Missouri River bridge connecting I-680 and Pershing Drive will attract approximately 16,000 vehicles per day in the Year 2020 (with Pershing Drive

open). This level of traffic would justify construction of four lanes on the bridge and on the approach roadways.

- A new Missouri River bridge connecting I-680 and Pershing Drive will attract sufficient traffic interchanging between I-680 and Eppley Airfield to allow 30th Street to operate at or near capacity through the Year 2020.

NO-BUILD ROADWAY SEGMENT LEVEL OF SERVICE

The Year 2020 level of service on the key roadway segments in the study under the No-Build scenario (assuming no improvements) was identified using the methodologies described in Chapter 2. Results of the segment traffic operations analysis are shown in Table 4-2. Base year results are shown for comparison purposes.

Table 4-2 Roadway Segment Analysis Summary – Year 2020 No-Build Conditions

SEGMENT	EXISTING			2020	
	ADT	CAPACITY	LOS	ADT	LOS
Storz Expressway (I-480 to Florence Boulevard)	19,050	63,400	A	30,900	A
Storz Expressway (Florence Boulevard to 16th Street)	15,600	43,200	A	26,300	B
Storz Expressway (16th Street to Abbott Drive)	11,000	43,200	A	20,600	A
30th Street (Dick Collins Road to Craig Street)	25,000	30,000	D	40,000	F
30th Street (Craig Street to Martin Avenue)	24,200	35,700	B	39,000	F
30th Street (Martin Avenue to Storz Expressway)	25,200	32,000	C	40,300	F
Dick Collins Road (30th/31st Street to JJ Pershing)	9,000	13,300	B	14,400	F
JJ Pershing (Dick Collins Road to 16th Street)	10,000	13,300	C	16,000	F
JJ Pershing (16th Street to Abbott Drive)	9,500	40,100	A	12,300	A
Abbott Drive (Storz Expressway to Airport entrance)	14,500	40,100	A	27,000	B
Craig Street (30th Street to JJ Pershing)	3,700	11,800	A	6,000	A
Abbott Drive (South of Airport entrance)	15,400	40,100	A	32,200	D

As noted in Chapter 2, existing corridor segments operate at LOS C or better. However, analyses conducted for the Year 2020 No-Build scenario suggest that very poor segment traffic operations will exist in certain locations. The entire 30th Street corridor will operate at LOS F. Abbott Drive south of the airport, will operate at LOS D. These

results imply that capacity improvements are required on the 30th Street corridor. Proposed improvements to Abbott Drive, as noted in the Master Plan, would be expected to mitigate the Year 2020 No-Build deficiencies in this area. Figure 4-2 illustrates Year 2020 No-Build segment volumes and LOS.

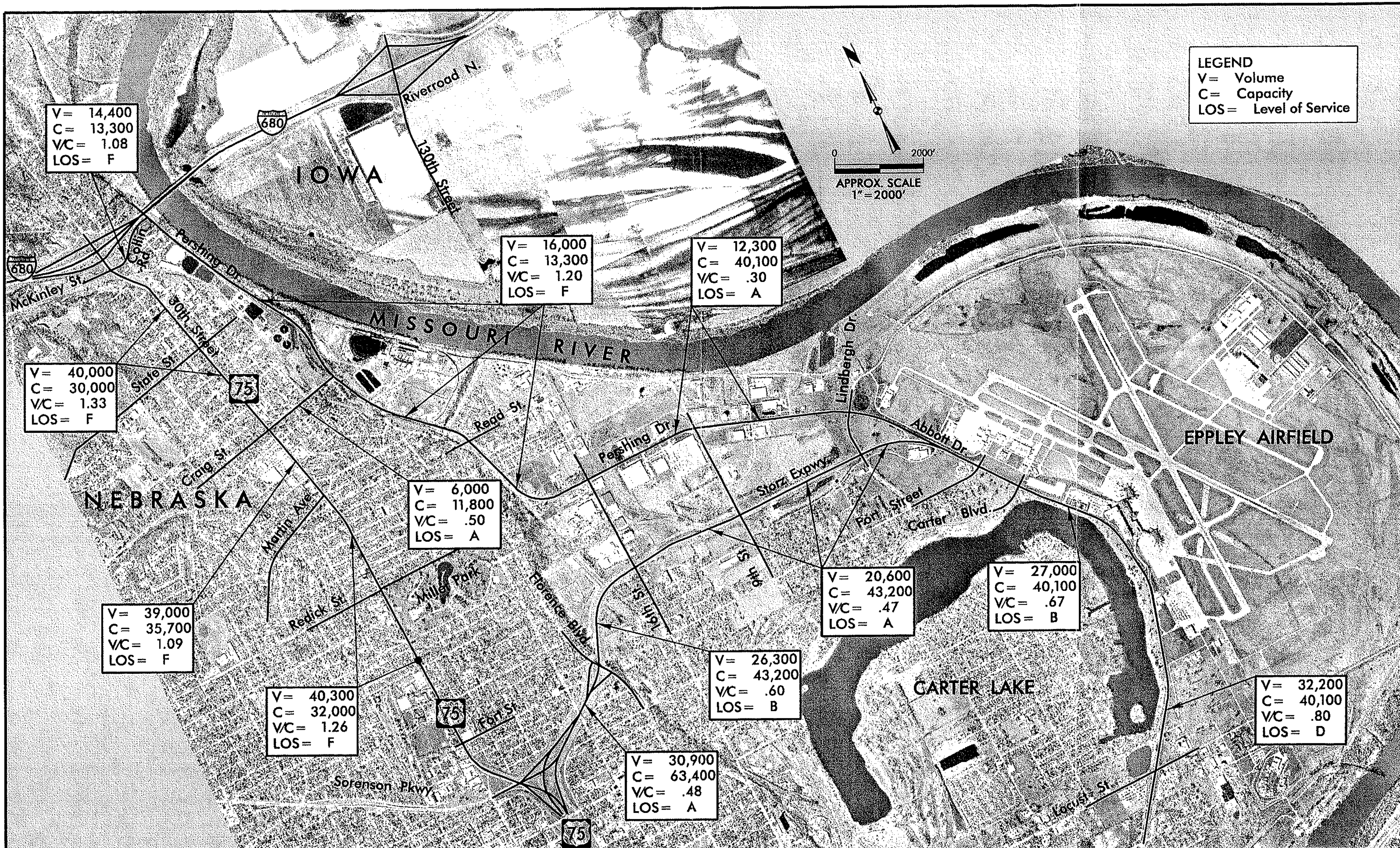
NO-BUILD INTERSECTION LEVEL OF SERVICE

The Year 2020 level of service at the key intersections in the study under the No-Build scenario (assuming no improvements) was identified using the methodologies described in Chapter 2. Results of the intersection traffic operations analysis are shown in Table 4-3. Base year results are shown for comparison purposes.

Table 4-3 Intersection Analysis Summary – Year 2020 No-Build Conditions

INTERSECTION	EXISTING LOS	GROWTH FACTOR	2020 NO-BUILD LOS
30th Street & Dick Collins Road	C	1.60	E
30th Street & State Street	C	1.60	C
30th Street & Craig Street	A	1.60	F
30th Street & Redick Avenue	B	1.60	C
30th Street & Fort Street	C	1.60	F
Storz Expressway & 16th Street	B	1.69	C
Storz Expressway & 9th Street	A	1.87	B
Storz Expressway & Abbott Drive	B	1.87	B
Pershing Drive & 16th Street	B	1.29	C
Pershing Drive and Read Street	B	1.60	F
Pershing Drive & Craig Street	A	1.60	A
Pershing Drive & Dick Collins Rd	B	1.60	F

The Year 2020 No-Build intersection analysis assumed a cycle length of 120 seconds for all signalized intersections. As noted in Chapter 2, no deficient intersections exist for the base year analysis. However, under Year 2020 volumes, five intersections are expected to degrade to LOS D or worse including the key intersections of 30th Street with State Street, Craig Street and Fort Street. At Craig Street, the poor level of service results primarily from the volume increase for the westbound right turn movement. The all-way stop-controlled intersections at Pershing Drive/Read Street and Pershing Drive/Dick Collins Road will be expected to operate at LOS F. Figure 4-3 illustrates Year 2020 No-Build intersection volumes and LOS.



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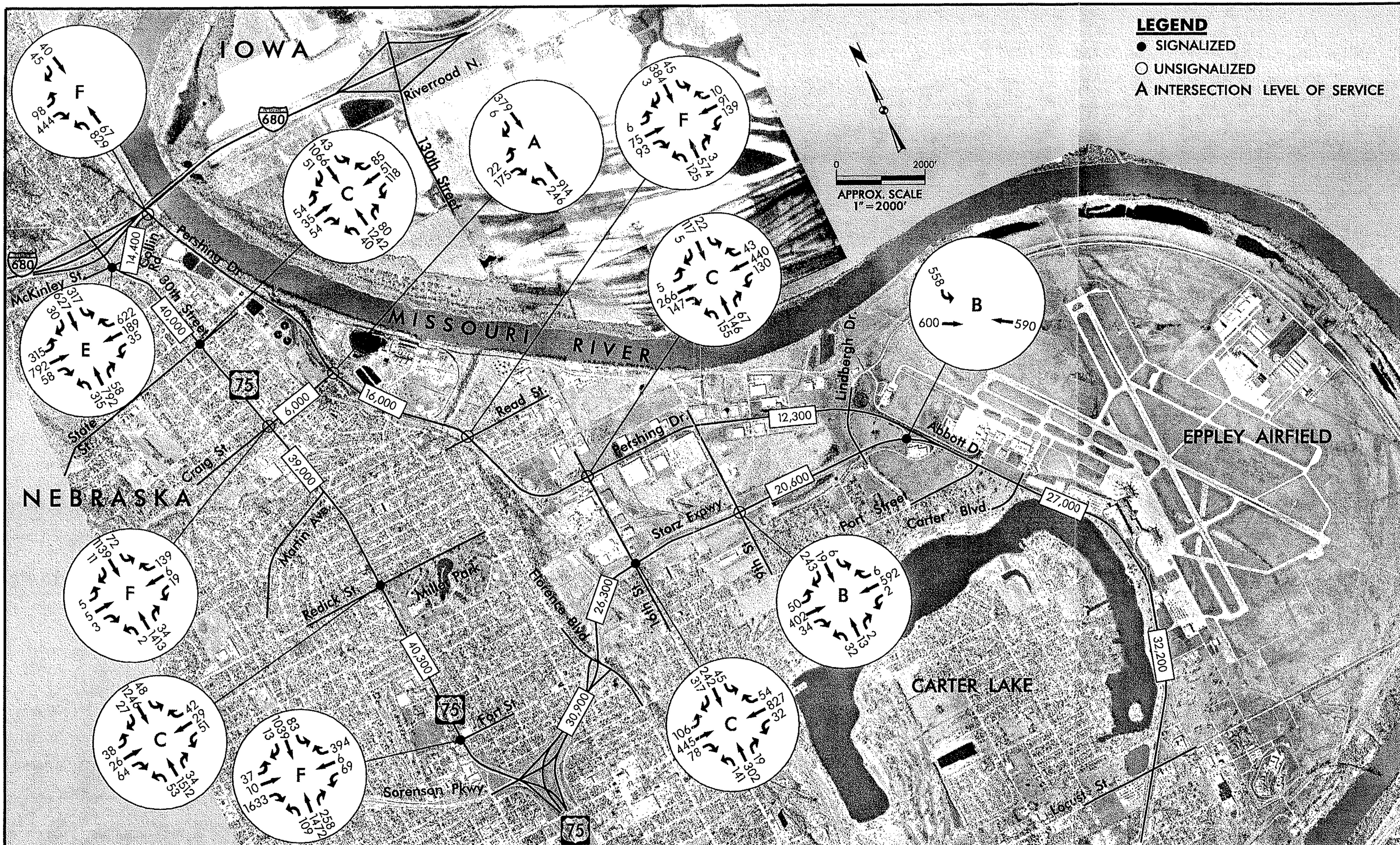

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I- 680 TO EPPLEY AIRFIELD CORRIDOR STUDY

2020 NO-BUILD INTERSECTION VOLUMES AND LOS

EXHIBIT
4-3

FUTURE CONDITIONS SUMMARY

The following are the key points identified through the future conditions analysis:

- Eppley Airfield enplanements have doubled in less than six years. They are projected to increase by another 125% in 15 years. Cargo volume (which equates to trucks) has shown an even more dramatic increase.
- The current 5 year TIP indicate no plans to improve the roadway between I-680 and Eppley.
- The 2020 LRTP indicates a widening of I-680 to six lanes in Nebraska and a new 4 lane route from I680 to the Storz Freeway via the UPRR railroad spur. As previously pointed out, this connection does not appear feasible.
- Traffic forecasts indicate the volume on the roads leading to Eppley from I-680 will increase approximately 50%
- If a new bridge over the Missouri River was available today to provide a more direct route to the industrial area / airport it would carry approximately 9,000 vehicles per day.
- By 2020 it would carry 16,000 vehicles per day making it the fourth highest volume bridge over the Missouri River in the Omaha region behind the three interstate bridges.
- If Pershing Drive were closed today the vast majority of the volume would be forced to 30th Street which would push the roadway to capacity.
- 2020 no-build analysis indicates that the routes to the airport would be up to 30% over capacity.

CHAPTER 5: CORRIDOR ALTERNATIVES

Recommended immediate and short term improvements in the study area are outlined in Chapter 6. These improvements are recommended to address safety related or route guidance deficiencies in the study area. However, in recognition that short term or minor improvements will not be sufficient to serve Year 2020 traffic forecasts in the study area, a wide range of long term alternatives were considered. These alternatives focused primarily on the provision of additional capacity and on accessibility. The alternatives were grouped into two categories: alternative concepts for an improved connection between the I-680/30th Street interchange and Eppley Airfield (Non-Bridge Alternatives) and alternative concepts for a new Missouri River bridge (Bridge Alternatives).

DESIGN CRITERIA

Absolute design criteria was not established. The relative goal of improving travel times through a relatively free-flowing facility implicitly dictates a general design criteria. NDOR uses 6000 vpd as a threshold for four lanes. Application of general highway capacity manual procedures indicates a need for four lanes at about 12,000 vpd. Thus the 2020 volume indicates a need for a four lane facility.

In general a four lane divided facility can be accommodated in a 100 foot right of way. However cut or fill backslopes can increase this amount. A 100 foot right of way would be indicative of a closed drainage system. Such a system would be likely on non-bridge alternatives on the Nebraska side.

An open drainage system exists on the Storz Expressway resulting in a much wider right of way. Such a system would be likely on the Iowa side. It is not unusual for the right of way widths to increase to 200 feet on rural expressways.

Rural expressways are often designed for high speed travel in the 55 to 65 mph range. Such a design speed on the Nebraska side is not realistic. Relatively free-flowing arterials within an urban environment are often designed a speeds of 40 to 45 mph.

Lastly, it was not the goal to provide a free flowing route all the way from I-680 to the airport. Right angle turns and traffic signals will be required at various locations. The goal is to minimize such impediments. However doing so at the expense of major right of way impacts is not a wise expenditure of funds.

NON BRIDGE ALTERNATIVES

Five alignments for an improved connection between the I-680/30th Street interchange and Eppley Airfield were investigated. The alignments include:

- Pershing Drive Alignment (Existing)
- 30th Street Alignment
- 30th Street / Craig Street / Pershing Street Alignment
- Partial Rail Alignment
- Full Rail Alignment

Pershing Drive Alignment

Shown in Exhibit 5-1, this alternative would widen the existing Pershing Drive corridor to a four-lane facility. This includes Dick Collins Road from 30th Street to Pershing Drive. This upgraded corridor would tie into the existing four-lane facility at 16th Street and Pershing Drive. The advantages of this alternative are that it consolidates airport area bound truck and passenger vehicles onto the currently signed route; it provides an aesthetically pleasing drive to the airport via the west Missouri River bank; and it separates airport area traffic from the 30th Street corridor by providing a dedicated route to the airport area.

The disadvantages of this long-term alternative are that it assumes usage of the privately owned portion of Pershing Drive near MUD; it still requires four right-angle turns; and it assumes the construction of a four-lane facility in an area that currently has slope stability issues and very limited ROW potential.

A detailed traffic study was not conducted at the 30th Street / I-680 interchange to ascertain how it would operate with all 2020 traffic passing through it. Specific to this alignment the two right angle turns between 30th Street and Pershing Drive at Dick Collins Road raise concern over turn lane capacity with respect to upwards of 16,000 vehicles per day making these two turns. In general it can be stated that the 300 foot separation between the south ramp terminals and Dick Collins Road, even though it has four lanes, will likely be a source of congestion.

The disadvantages were considered to be fatal flaws and a significant deviation from the desired design criteria, thereby removing it from further consideration.

30th Street Alignment

Shown in Exhibit 5-2, this alternative would widen 30th Street to six lanes from the I-680 interchange on the north to Storz Expressway on the south. Such capacity improvements would be necessary to accommodate the combination of airport and non-airport related traffic. The advantages of this alternative are that it consolidates trucks and passenger vehicles on one route; removes the circuitous route currently in place; removes all but one right-angle turn; and it avoids the MUD-owned portion of Pershing Drive. The high volume right angle turns present in the Pershing alignment would not be present.

The disadvantages of this alternative are the severe neighborhood and business impacts that will occur if 30th Street is widened; the negative impact on the historically registered Florence area; and the mixing of airport area traffic with local traffic. Additionally it should be pointed out that the travel time would be relatively poor when compared to other long term options due to the number of signals and congestion along 30th Street.

Once again the disadvantages were considered to be fatal flaws thereby also removing this alignment from serious further consideration. Of note, this alignment bears striking similarities to some of the North Freeway alignments proposed in the 1970's and would likely be perceived as an effort to reintroduce this concept.

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LONG TERM ALTERNATIVES
PERSHING DRIVE ALIGNMENT

EXHIBIT
5–1

User: DAVID J RAYER
Project number: 08526-003-134

HDR HDR Engineering, Inc.	Metropolitan Area Planning Agency I – 680 TO EPPLEY AIRFIELD CORRIDOR STUDY	LONG TERM ALTERNATIVES 30TH STREET ALIGNMENT	EXHIBIT 5–2

30th Street / Craig Street / Pershing Drive Alignment

Shown in Exhibit 5-3, this alternative would utilize 30th Street between I-680 and Craig Street, Craig Street and Pershing Drive as the long-term route to the airport. This alternative addresses the Pershing Drive issues adjacent to MUD and the Missouri River. However, 30th Street would still require widening to six lanes, although just that portion north of Craig Street. Craig Street and Pershing Drive would require reconstruction to provide a four-lane divided facility that ties in to existing Pershing Drive at 16th Street. In addition to avoiding Pershing Drive at MUD the advantages of this long-term alternative are that it consolidates trucks and passenger vehicles on one route.

The disadvantages of this alternative are that it will severely impact the north 30th Street corridor in terms of ROW and Florence's historical significance; it still requires three right-angle turns; and it mixes 30th Street traffic with airport traffic.

Although to some extent removing the "North Freeway extension look-alike" nature of the previous alignment, the negative impacts on 30th Street in the Florence area likely preclude this from further consideration.

Full Rail Alignment

Shown in Exhibit 5-4, this alternative would utilize the railroad ROW for a four-lane facility to connect from the I-680 interchange on the north to just west of the intersection of 16th Street and Pershing Drive. This alternative assumes that rail service to MUD would be terminated. The advantages of this alternative are that it separates airport area traffic from the 30th Street corridor; it removes the circuitous route; and it avoids the MUD portion of Pershing Drive.

However the disadvantages of this route are significant. Many of the disadvantages pointed out in the next alternative apply to this one. The over riding fatal flaw of this alignment is its use of the active portion of the rail line to MUD.

Partial Rail Alignment / West of MUD Alignment

Shown in Exhibit 5-5, this alternative would construct a four-lane facility on a portion of the railroad ROW from the intersection of 30th Street and Dick Collins Road to a point near MUD's chemical building. This section of the track is not currently used and thus could be converted to a roadway use. At this point the alignment would cross over the spur track to the MUD chemical storage building across the southern undeveloped section of MUD's property and join up with Pershing Drive at Craig Street. 30th Street would "T" into the new alignment at the north end near I-680.

As opposed to the full rail alignment, this option only utilizes the abandoned portion of the railroad right of way. This alternative would allow MUD to continue to use the track for inbound chemical shipments. The advantages of this alternative are similar to the previous alternative. It separates airport area traffic from the 30th Street corridor, it removes the circuitous route; it avoids the MUD portion of Pershing Drive; and it utilizes the existing portion of Pershing Drive south of Craig Street.

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User: DAVID J RAYER
Project number: 08526-003-134

HDR HDR Engineering, Inc.	Metropolitan Area Planning Agency I– 680 TO EPPLEY AIRFIELD CORRIDOR STUDY	LONG TERM ALTERNATIVES 30TH / CRAIG / PERSHING ALIGNMENT	EXHIBIT 5–3

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LONG TERM ALTERNATIVES
FULL RAIL ALIGNMENT

EXHIBIT
5–4

User: LEON R GOLDING
Project number: 08526-003-134

HDR
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I– 680 TO EPPLEY AIRFIELD CORRIDOR STUDY

LONG TERM ALTERNATIVES
PARTIAL RAIL ALIGNMENT

EXHIBIT
5–5

On the negative side, the rail right of way through the northern section along MUD is relatively narrow and would not be wide enough to construct a four lane roadway. In addition to the tight corridor provided by the rail right of way west of the MUD plant, MUD has identified the possible need to expand their existing facilities and is attempting to acquire the unused portion of rail right of way for expansion. Approximately 16 homes and 5 businesses would need removed for this alignment.

The geometry of the tie-in at 30th Street near I-680 is of primary concern. This alignment would has a less than desirable intersection at 30th Street south of I-680 near the Florence Library & Recreation Center. Additionally, it would adversely effect, if not eliminate, Filmore Park. This small park contains tennis courts and a baseball field and is adjacent to the Florence Center.

Perhaps the most compelling reason against this alternative rests in the alignment traversing the southern area of the MUD property. MUD has conceptual plans to also expand into this area with additional clarifiers and has indicated that they would strenuously oppose any alternative that eliminated expansion options.

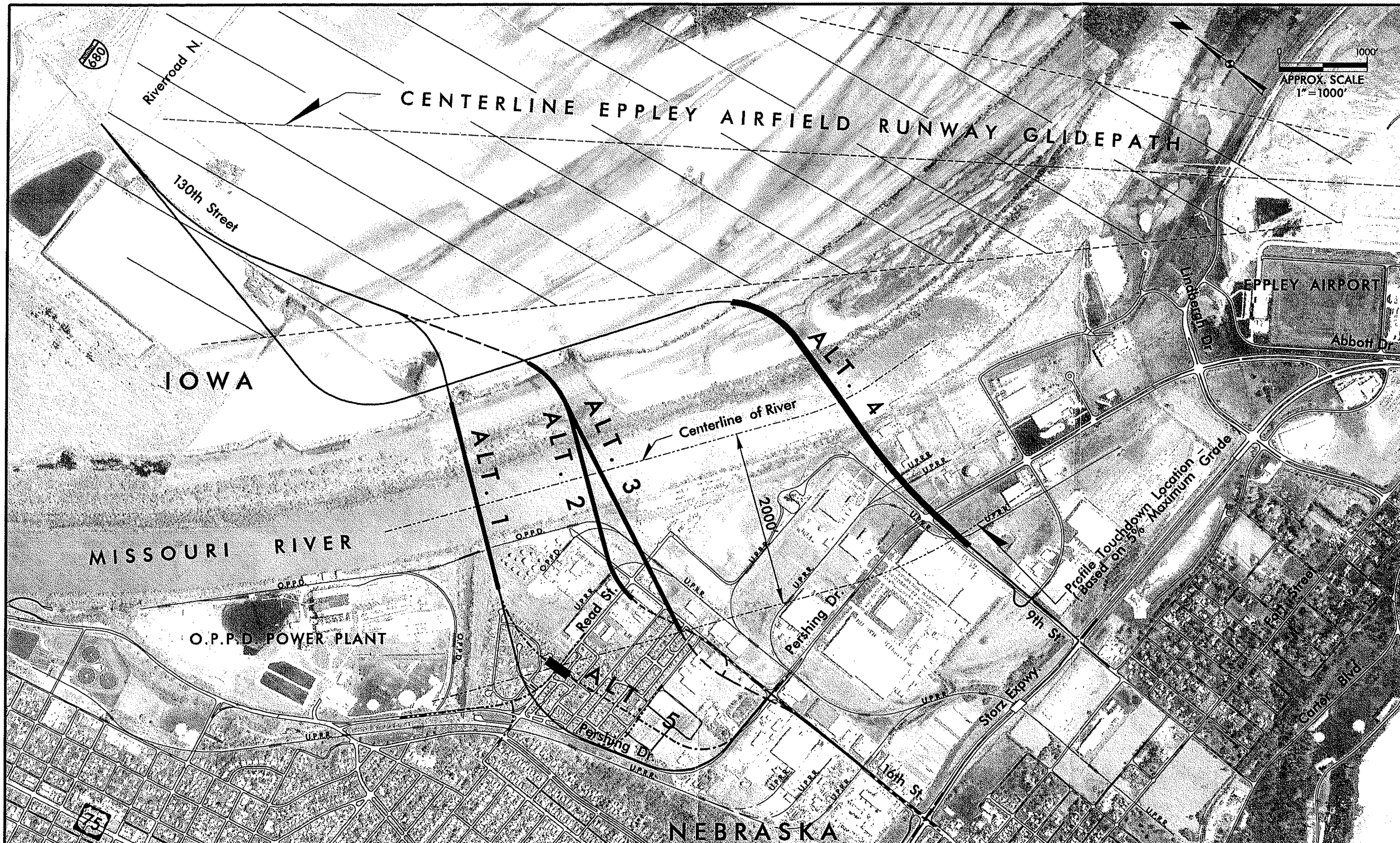
Assuming the right of way concerns could be overcome, the functional aspects of the 30th Street junction still raise concern. Under this alternative the 40,000 ADT 30th Street would be become a "T" intersection with the 16,000 ADT new roadway. Whereas major intersections have 60 to 80% of their traffic as through volume, this arrangement would push the turning volume to these levels. This is not good design practice. Lastly, the through-movement integrity of US 75 (30th Street) would be compromised.

A true fatal flaw does not exist for the partial rail alignment, as it does for the other Nebraska side long range improvements. However there are many "near fatal flaws", and right of way concerns that can not be answered at this time. The wide range of near-fatal flaws led to the removal of both rail line options from consideration as viable long-term solutions.

BRIDGE ALTERNATIVES

Five alignments for a new Missouri River bridge and approach roadways connecting I-680 in Iowa (Interchange 1) with Pershing Drive or Storz Expressway were investigated. The advantages of a new bridge are that it will consolidate trucks and passenger vehicles on one route. It would provide better traffic operations than any other alternative; it would avoid impacts to the 30th Street and Pershing Drive corridors; and it would provide development potential on both the Iowa and Nebraska side of the Missouri River. The disadvantages of this long-term alternative is the high cost associated with a new bridge; and the residential and commercial property impacts on the Nebraska side of the river.

The five alignments are shown in Exhibit 5-6. All of the alignments cross perpendicular or nearly perpendicular to the Missouri River for cost and constructibility reasons. All of the alternatives assume a four-lane divided roadway. Between I-680 in Iowa and Pershing Drive in Nebraska the proposed design standard is for a controlled access expressway type facility. Access would generally be permitted only at public roads and



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I– 680 TO EPPLEY AIRFIELD CORRIDOR STUDY

LONG TERM ALTERNATIVES
NEW BRIDGE ALIGNMENTS

EXHIBIT
5–6

have a spacing of one-half mile or more. The bridge would be a single four lane structure, not twin two lane structures.

It should be pointed out that the soils in the river valley area are highly compressible. The Storz Expressway required a significant amount of remedial soil mitigation. The bridge lengths shown in the various alternatives represent the minimum bridge length. It is possible that the location and or height of the fill may require extended bridge lengths to span poor soil locations. On the Iowa side the alignments traverse near a former landfill. The extent to which these alignments directly cross the landfill and the extent to which extraordinary construction methods may be required were not evaluated. It was beyond the scope of this study to make determinations on geotechnical issues.

Exhibit 5-6 illustrates several of the major issues that will need to be addressed with a new river bridge. The approach area (glide path) for Eppley Airfield's Runway 14 extends outward and upward to encompass I-680 Interchange 1 and a portion of the roadway approaches on the Iowa side of the river. Given their distance to the end of the runway, however, none of the alternatives would be expected to violate Federal Aviation Administration (FAA) airspace requirements.

Many of the railroad spurs in the area are also shown in Exhibit 5-6. Most of these spurs serve the industrial properties in the area. Except for the OPPD coal line, the frequency in the area is very low. The coal line spur currently crosses Pershing just east of 16th Street. Occasional blockage of over five minutes does occur at this crossing. Storz Expressway is grade separated with this line thus an optional crossing exists. It was not a set criteria to grade separate with all crossings. In most cases the profile of the bridge dictated that the roadway pass over the tracks. The existing Pershing crossing east of 16th Street was not considered for grade separation as part of any of these alternatives.

Exhibit 5-6 depicts a line, located approximately 2000 feet from the center of the Missouri River. This line represents the profile touchdown location assuming a maximum five percent grade on the approaches to the bridge. Thus, the line represents the nearest point to the river at which the profile of the roadway would match existing grade. Alternative 4 because of its inability to provide an at grade tie in with Pershing Drive passess over Pershing Drive and provides an at-grade intersection with Storz Expressway. All other alternative concepts are shown to intersect at-grade with or transition onto, the alignment of Pershing Drive.

A high voltage transmission line runs along the river south from OPPD. Through review of the alignments with OPPD it was determined that enough vertical clearance can be provided to their transmission lines, such that no relocation would be necessary. Furthermore these alternatives were developed to miss the support towers for the various transmission lines.

Alternative 1

Alternative 1 would cross the Missouri River nearest OPPD, bisect a trailer home park and would then tie into the existing alignment of Pershing Drive just south of Read

Street. Read Street and Pershing Drive to the north would be realigned to intersect the new roadway. Traffic destined to Storz Expressway from the bridge would be required to make a right turn at 16th Street or at 9th Street. Given that it would be difficult to provide access to trailer homes not directly impacted by the alignment, it was assumed that up to 150 trailer homes would be impacted. No businesses would be impacted. This alignment has the shortest bridge and provides a free flowing connection to Pershing Drive.

Alternative 2 & 3

Alternative 2 and 3 are the "16th Street" options. These alternatives were developed because they line up with 16th Street which is a main north / south arterial through north Omaha. However the need to line up with 16th Street is reduceded as most traffic desires to turn east at Pershing or Storz. Alternative 2 would cross the Missouri River, pass over Read Street and then tie into 16th Street north of Pershing Drive. The impact to the trailer park is significantly reduced under this option, and Alternative 3, but the business impact is increased. Alternative 2 would impact approximately 15 trailer homes and two major businesses. Alternative 3 is similar to Alternative 2 but utilizes a longer bridge to pass over 16th Street and then tie into 16th Street south of Pershing Drive. It would impact approximately 15 trailer homes and four major businesses.

The segment of 16th Street from Pershing to Storz has a significant number of driveways. This, and the amount of truck operations on and adjacent to the roadway do not make this segment conducive to expressway type traffic. Thus it should be assumed that most traffic to / from the airport would turn left at this location. The introduction of a right angle turn makes these two alternatives less desireable. Thus it is possible that the segment on 16th Street from Pershing to Storz would not need to be reconstructed. This could reduced the cost of these alternatives by approximately $1 million.

Alternative 4

Alternative 4 is considered the "9th Street" option. However, as previously noted, the alignment profile would not permit an at-grade intersection at Pershing Drive. Thus, Alternative 4 would pass over Pershing Drive and a nearby railroad spur prior to tying into 9th Street just north of Storz Expressway. Although in close proximity to the ACT Heartland Terminal, this alignment does not take this businesses. One business between Pershing Drive and Storz Expressway along 9th Street would be displaced. No residential properties are displaced.

Although the curvilinear alignment on the Iowa side does meet the desired speeds, but requires approximately 2000 feet more of roadway. The bridge crossing location and proximity of Pershing Drive in this area results in a bridge approximately 1000 feet longer than any of the other alternatives.

Alternative 5

Alternative 5 utilizes the bridge alignment of Alternative 1 but extends southward at approximately the midway point between 16th Street and Pershing Drive. The roadway would bridge over Read Street, and match existing grade near Ida Street, and provide a

free-flowing connection to Pershing Drive near 16th Street. Alternative 5 would impact approximately 71 trailer and free-standing homes and one small business.

Alternatives one and five bisect the trailer park. At this level of study it appears that alternative five has a reduced impact on the area. Detailed design and more accurate base mapping is necessary to accurately determine the exact number of impacts.

ENVIRONMENTAL OVERVIEW

The purpose of the environmental overview was twofold:

1. Identify the potential environmental impacts or fatal flaws of any of the proposed improvement options.
2. Identify the environmental documentation process, approvals, permits, authorizations or actions that would be required for the various improvement options.

The proposed corridor were reviewed with respect to the following potential issues:

- Wetlands/stream crossings
- Threatened and Endangered Species/Critical Habitat
- Section 4(f) properties (i.e., parks)
- Environmental Justice (i.e., mobile home parks, low income housing, elderly communities)
- Communities (i.e., bisecting/displacing neighborhoods)
- Farmlands
- Hazardous materials sites
- Aesthetics (i.e., parks, golf courses)

All Alternatives cross the Missouri River. This segment of the Missouri River has been channelized for flood control and is maintained as a navigable waterway. Designated as a navigable waterway, the Missouri River is under the jurisdiction of the U.S. Coast Guard and the U.S. Army Corps of Engineers – Omaha District, maintains the channel.

On the Iowa side of the project area, Alternatives 1, 2, 3, 4, and 5 would potentially impact agricultural lands, which are currently utilized for livestock grazing and row crops. The area of impact is dependent on the alternative route length. On the left bank of the Missouri River, all Alternatives would potentially impact a wetland area (according to the National Wetland Inventory (NWI) Map; however we were unable to verify this wetland information due to the area being privately owned and were denied access) before crossing the Missouri River. On the right bank of the river, all Alternatives would cross the City of Omaha levee system and the Union Pacific Railroad Company tracks. Alternative 1 would impact the Morning Glory Lane Trailer Park (potential Environmental Justice issue), cross Read Street, and impact the Northwest corner of Ponderosa Village Trailer Park (potential Environmental Justice issue). Alternative 1 then proceeds to align with Pershing Drive.

After crossing the Missouri River from Iowa, Alternative 2 will potentially impact two liquid storage tanks (potential hazardous materials present), Omaha Public Power District transmission line towers, and other utility lines. Alternative 2 then crosses business property.

(Barnett & Ramel Optical Co.), a vacant lot, property storage facility, trailer court (Home Park) (potential Environmental Justice issue), and a residence. Alternative 2 then proceeds to align with 16th street.

On the Nebraska side of the river, Alternative 3 will cross a vacant lot, Read Street, railroad tracks, and industrial facility (ABS Corporation)(potential hazardous materials present). Alternative 3 potentially impacts several residences, a trailer court (Home Park) (potential Environmental Justice issue), business (Packers Engineering & Equipment Company), vacant lot, and beer/liquor establishment (Wagon Tongue Bar). Alternative 3 then proceeds to align with 16th street.

Alternative 4 potentially impacts a barge commodity terminal (ACT Heartland Terminal), crosses Pershing Drive, and a vacant lot. Alternative 4 then proceeds to align with 9th street.

Alternative 5 crosses the river in the same alignment as Alternative 1. Alternative 5, then turns south potentially impacting the eastern edge of Morning Glory Trailer Park (potential Environmental Justice issue) and Omaha Public Power District transmission line towers. Alternative 5 crosses Read Street and potentially impacts Maple Grove Trailer Park (potential Environmental Justice issue), two residences, crosses a vacant lot, and then proceeds to align with Pershing Drive.

The most significant environmental issues noted during our site visit were the crossing of the Missouri River (all Alternatives), potential Environmental Justice issues (Alternatives 1, 2, 3, & 5), Farmland impacts (all Alternatives), impacts to businesses, and potential wetland impacts (Alternatives 1, 2, 3, & 5). All Alternatives will require crossing roadways and railroad lines.

Permits and approvals that may be required include an U.S. Coast Guard permit for crossing navigable waterways, Section 404/10 permit for wetland/stream crossings and discharge, Section 106 coordination with the State Historical Preservation office if any cultural, historical, or archeological resources are impacted, and coordination with the USDA Natural resources Conservation service for impacts to prime and unique farmlands. We have initiated early coordination with the following agencies:

United States Coast Guard
Environmental Protection Agency – Region VII
U.S. Army Corps of Engineers – Omaha District
United States Department of Interior Fish and Wildlife Service
State of Nebraska – Department of Environmental Quality

Nebraska Game and Parks Commission
Nebraska Natural Resources Commission
Papio-Missouri River Natural Resource District
Nebraska State Historical Society
State Historical Preservation Office of Iowa
Iowa Department of Natural Resources

The USFWS identified five threatened and endangered species, which may occur within or near the proposed corridor alternatives. The listed species are as follows:

Peregrine falcon (Falco peregrinus)
Bald Eagle (Haliaeetus leucoephalus)
Interior least tern (Sterna antillarum)
Piping plover (Charadrius melodus)
Pallid sturgeon (Scaphirhynchus albus)

The USFWS also included two species which have been petitioned for listing and subsequent determination that listing is warranted. The two species are identified as sicklefin chub (Macrhybopsis meeki) and sturgeon chub (Macrhybopsis gelida).

The USFWS may require a habitat survey for any of the previously identified species (and based on our site visit, it is our determination that potential habitat exists for some species).

In a phone conversation with the U.S. Coast Guard, they indicated that an Environmental Impact Statement would be required for this project. If the project is funded through the Federal Highway Administration (FHWA), FHWA would be considered the lead agency and the U.S. Coast Guard, along with the, U.S. Army Corps of Engineers (USACE) would be cooperating agencies. If the project is privately funded, the U.S. Coast Guard would be considered the lead agency and FHWA and USACE would be cooperating agencies.

ESTIMATED CONSTRUCTION COSTS OF ALTERNATIVES

The estimated construction cost in 1998 dollars for each of the long term alternatives that were considered in this study are summarized in Table 5-1. The estimated costs include a rough estimate of right-of-way and relocation costs. The estimates do not include engineering and construction management which generally add 10 to 15%.

It must be emphasized that these costs are based on conceptual design only using a limited number of unit prices, per mile costs, and general percentages. At this stage they are most useful for relative comparisons. Unknowns relating to soil conditions that may force a greater use of bridge structure, or significant other geotechnical design requirements can not be accurately assessed at this study level.

Right of way costs were estimated by adding 25% to the assessed value of a particular property. This was done to account for relocation costs. Trailer home impacts were based upon recent experience from the NDOR on a project in west Omaha.

The substantial number of trailer homes impacted and the relatively high unit price per unit offsets the construction cost savings of the shorter routes. Although alternative one is the least expensive from a construction cost standpoint, its high right of way cost negates the savings. In general the costs are within 10% of each other. Given the unknowns at this level it would be reasonable to cite a $30 to $35 million construction and right of way cost.

Table 5-1 Estimated Construction Costs of Alternatives

Alternative	Estimated Construction Cost
Non Bridge Alternatives	
Pershing Alignment	$14,000,000
30th Street Alignment	$25,000,000
30th / Craig / Pershing Alignment	$15,400,000
Partial Rail Alignment	$9,200,000
Full Rail Alignment	$10,500,000
Bridge Alternatives	
Alternative 1	$31,700,000
Alternative 2	$29,200,000
Alternative 3	$33,100,000
Alternative 4	$33,100,000
Alternative 5	$31,300,000

** For budgeting purposes the above numbers should be considered the midway point of a plus or minus 10% range.

CHAPTER 6: RECOMMENDED CORRIDOR IMPROVEMENTS

The primary objective of this study was to identify the need for, the type of, and location of a transportation facility to serve as a connection between Eppley Airfield and I-680. Based on traffic analyses performed as part of this study and based on funding constraints facing the participating agencies, this study recommends that this "connection" be developed as demand dictates and as funding permits. As such, the recommended improvements of this study are provided for three planning horizons: immediate, short-term, and long-term. Simply waiting 10 to 15 years for the implementation of a long term multi-million dollar improvement does nothing to address current deficiences.

IMMEDIATE IMPROVEMENTS

Immediate improvements address safety related or route guidance problems. Further, immediate improvements typically do not solve the overall corridor problems but they do buy valuable time that is needed to address the real corridor problems.

The existing corridor conditions in general, provide adequate capacity and LOS on all roadways to and from the airport. However, the existing route exhibits several non-capacity related deficiencies. The route is circuitous and requires trucks to use a separate route from passenger vehicles. Additionally, the existing corridor roadways are designed to minor arterial and/or collector standards and require traversing a stretch of private road along MUD. Further, four right-angle turns and three all-way stops are required along the signed roadway to the airport. Finally, poor pavement conditions exist throughout the existing corridor roadways.

Immediate improvements are to address the existing deficiencies, regardless of long-term operational needs. These improvements will improve route delineation but will not address potential capacity deficiencies that would result from closure of Pershing Drive, near MUD. Six immediate corridor improvements are recommended.

- Revise signed airport route to 30th Street / Craig Street / Pershing Drive
- Geometric improvements at I-680 / 30th Street interchange
- Striping / traffic signal improvements at 30th Street / Craig Street
- Geometric improvements at Pershing Drive / Florence Boulevard
- Geometric / traffic signal improvements at Pershing Drive / Read Street
- Geometric / traffic signal improvements at Pershing Drive / 16th Street

Revise Signed Route to Eppley Airport

This study recommends that the signed route to Eppley Airfield for trucks and passenger cars be revised to address the existing deficiencies noted above and to proactively address the possibility that MUD could close Pershing Drive in the vicinity of their plant. The proposed route would utilize 30th Street between I-680 and Craig Street; Craig Street between 30th Street and Pershing Drive; and Pershing Drive, south of Craig Street. MUD officials have stated that they have no immediate plans or need to close Pershing Drive, although there are no guarantees of this. As such, it is assumed that Pershing Drive

would remain open as an unsigned secondary route for passenger car traffic only. An increase in traffic on 30th Street and Craig Street would be expected with this change. This increase is not expected to diminish traffic operations substantially given that peak travel times for traffic destined to the airport do not necessarily coincide with traditional traffic peaks.

This improvement would require modifications to many of the existing signs in place and/or require new signs. The new signs would consist of trailblazer signs along the route as wells as highly visible guide signs (e.g., illuminated overhead signs on cantilever structures) at key decision points.

I-680 / 30th Street Interchange

Geometric improvements are recommended at the I-680/30th Street interchange as shown in Exhibit 6-1. The primary improvement would consist of extending the turn bay for traffic turning left from northbound 30th Street to westbound I-680 (i.e., for outbound traffic from the airport). Although the ramp terminal intersections do not currently meet warrants for the installation of traffic signals, these intersections should be monitored to determine if signals could be warranted in the future.

30th Street / Craig Street

The recommended immediate improvements at the intersection of 30th Street and Craig Street are shown in Exhibit 6-2. The improvements include the installation of a traffic signal and revisions to pavement markings on 30th Street to allow extension of the turn bay for traffic turning from southbound 30th Street to eastbound Craig Street. A dual right turn lane may be required for traffic turning from westbound Craig Street to northbound 30th Street.

Pershing Drive / Florence Boulevard

The recommended immediate improvements at the intersection of Pershing Drive and Florence Boulevard are shown in Exhibit 6-3. The improvements are intended to address the high frequency of truck accidents at the low-clearance railroad bridge carrying the UPRR spur line over Florence Boulevard. The improvements include the reconfiguration of the intersection so that Pershing Drive becomes the through route and Florence Boulevard becomes a "T" intersection with stop-sign control. This improvement should diminish the frequency and severity of such accidents by requiring trucks to make a low-speed right turn to get onto Florence Boulevard. This reconfiguration of the existing intersection will not impact the existing railroad bridge.

Pershing Drive / Read Street

The recommended immediate improvements at the intersection of Pershing Drive and Read Street are shown in Exhibit 6-4. The improvements include the installation of a traffic signal and reconstruction of the intersection to provide exclusive left turn lanes on all approaches. The north, south, and east approaches will have separate right-turn bays as well. This intersection improvement will remove the current free-flow right for the east approach.

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RECOMMENDED IMMEDIATE IMPROVEMENT
I–680 / 30TH STREET

EXHIBIT
6–1

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RECOMMENDED IMMEDIATE IMPROVEMENT
30TH STREET / CRAIG STREET

EXHIBIT
6–2

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RECOMMENDED IMMEDIATE IMPROVEMENT
PERSHING DRIVE / FLORENCE BOULEVARD

EXHIBIT
6–3

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RECOMMENDED IMMEDIATE IMPROVEMENT
PERSHING DRIVE /READ STREET

EXHIBIT
6–4

Pershing Drive / 16th Street

The recommended immediate improvements at the intersection of Pershing Drive and 16th Street are shown in Exhibit 6-5. The improvements include the installation of a traffic signal and reconstruction of the north and south approaches to provide exclusive left turn lanes.

SHORT TERM IMPROVEMENTS

Short-term improvements expand on safety related and route guidance issues. Additionally, short-term improvements can begin to address capacity related problems and continue to provide time until the ultimate corridor solution is ready to be implemented. Ideally, short-term improvements can be integrated into the long-term solutions and not become "throw-away" measures.

The recommended short-term improvements in the corridor are intended to provide additional capacity along the proposed signed route which were of immediate benefit. Staged implementation of these improvements is recommended so that the additional capacity can be provided as needed. Two specific improvements are recommended.

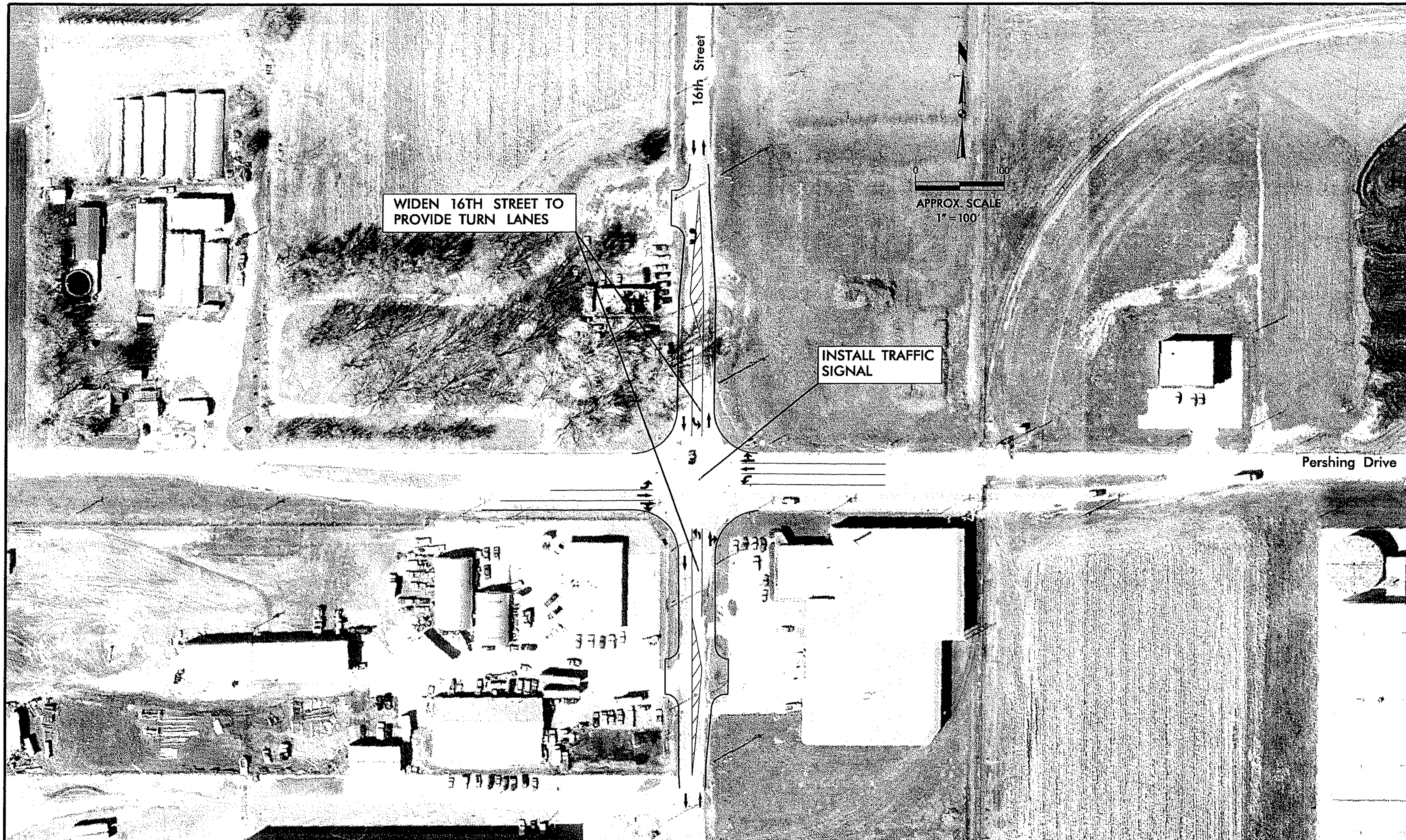
- Reconstruct Craig Street and Pershing Drive
- Remove parking on 30th Street, north of Craig Street

Reconstruct Craig Street and Pershing Drive

As traffic volumes grow in the corridor, additional capacity on Craig Street and Pershing Drive between 30th Street and 16th Street will be necessary. Each of these roadways are currently two-lane facilities with poor pavement condition. The recommended short-term improvement is to reconstruct both roadways to a three-lane facility, providing one through lane in each direction and a center turn lane. Exhibits 6-6 through 6-8 illustrate the recommended improvements. Exclusive right turn lanes would be constructed at several locations to provide maximum capacity. The intersection of Craig Street and Pershing Drive would be reconstructed so that Craig Street serves as the through movement. Pershing Drive to the north would "T" into Craig Street. A three-lane cross section on Craig Street and Pershing Drive will require pavement widening. A preliminary review of the existing right-of-way suggests that route widening will result in minimal impact to properties along these roadways.

Remove 30th Street Parking

On-street parking is currently provided on portions of 30th Street between I-680 and Craig Street. In these areas, a four-lane undivided cross section is provided. As such, left turns from 30th Street are made from a shared through-left turn lane. In combination, this situation and the turbulence caused by parking maneuvers has the tendency to result in some congestion during peak traffic periods. As traffic volumes on 30th Street and Pershing Drive increase, congestion in these areas may worsen. This study recommends



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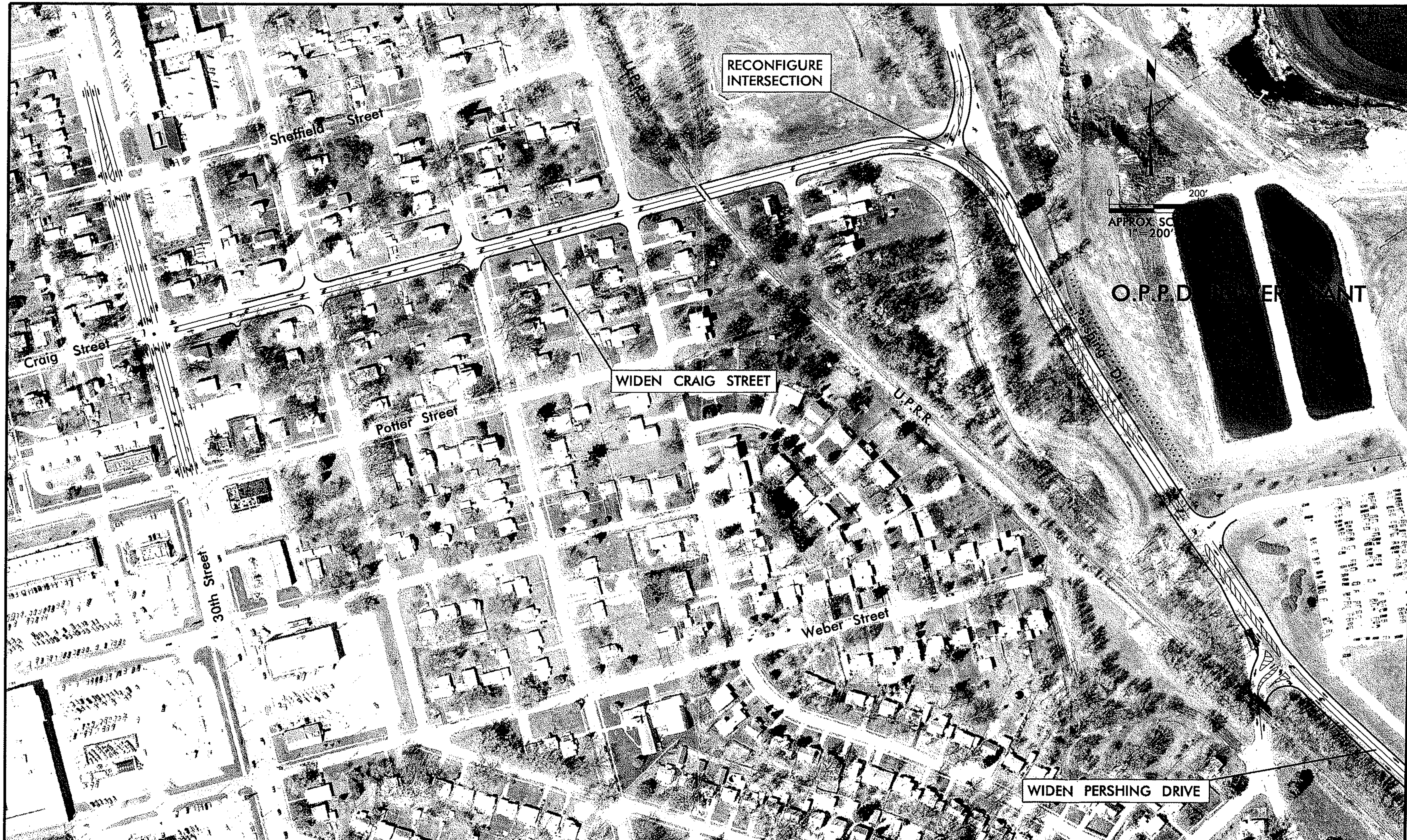
I– 680 TO EPPLEY AIRFIELD CORRIDOR STUDY

RECOMMENDED IMMEDIATE IMPROVEMENTS
PERSHING DRIVE /16TH STREET

EXHIBIT
6–5



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RECOMMENDED SHORT–TERM IMPROVEMENT
CRAIG STREET & PERSHING DRIVE (1 OF 3)

EXHIBIT
6–6

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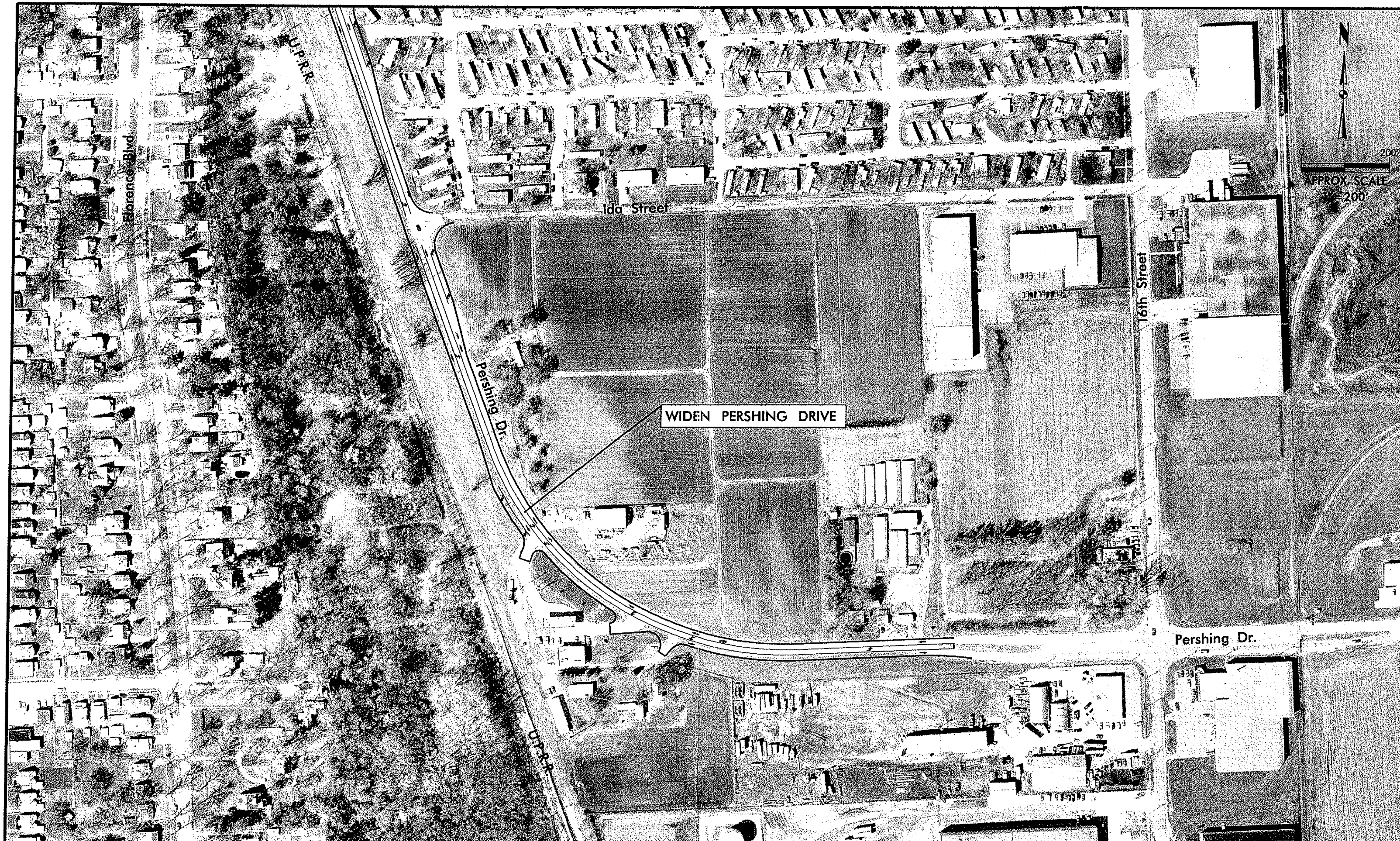
RECOMMENDED SHORT–TERM IMPROVEMENT
CRAIG STREET & PERSHING DRIVE (2 OF 3)

EXHIBIT
6–7

Project number: 08526-003-134



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I– 680 TO EPPLEY AIRFIELD CORRIDOR STUDY

RECOMMENDED SHORT–TERM IMPROVEMENT
CRAIG STREET & PERSHING DRIVE (3 OF 3)

EXHIBIT
6–8

that the City of Omaha monitor traffic volume growth on 30th Street to determine if and when additional capacity will be necessary. If additional capacity is necessary, a five-lane cross section is recommended. The five-lane cross section will provide two travel lanes in each direction and a continuous bi-directional left turn lane as the middle lane. This will require removal of on-street parking or will require significant pavement widening. Recognizing that pavement widening in the Florence downtown area will have significant property impacts, the preferred solution would be to remove on-street parking. To mitigate the loss of parking for merchants in the area, off-street parking lots could be developed but has not been investigated as part of this study.

LONG TERM IMPROVEMENT

Long-term improvements address the contributing circumstances facing the corridor. Rather than treat the symptom, which immediate and short-term improvements provide, long-term improvements treat the cause of the symptoms. Long-term improvements typically require significant capital expenditures and significant development and implementation time. The recommended long-term corridor improvement is to construct a new Missouri River Bridge. This will provide optimum route delineation, route consistency for drive expectancy, improved safety, and provide adequate capacity for the horizon year traffic forecasts. A new Missouri River Bridge crossing bridge is superior to other alternatives that were considered because of its consolidation of trucks and passenger vehicles onto one route. It would also provide better traffic operations than any other alternative and avoid impacts along 30th Street and Pershing Drive.

Construct New Missouri River Bridge

At this level of study it appears that either Alternative One or Five as depicted in Exhibit 5-6 is preferable. Until such time as further environmental, geotechnical and design detail can be accomplished it would be premature to lock in on a set alignment. It appears that the 16th Street alternatives (2 and 3) would significantly impact the industrial area for which the route is partly intended to serve. Furthermore the 16th Street options lack the desired design criteria from Pershing to Storz. The 9th Street option (alt. 4) could have some merit, but the curvilinear nature in Iowa and bridge geometry raise concern. The environmental process will determine the environmental, social, and the economic trade-offs of particular river crossings.

ESTIMATED CONSTRUCTION COSTS

The estimated construction costs for the recommended immediate, short-term and long-term improvements are summarized in Table 6-1. The cost estimates were developed in the same manner as described in Chapter 5. Design and construction management would add approximately 15% to the cost. This is not included in the estimates.

IMPLEMENTATION OF THE RECOMMENDED IMPROVEMENTS

The corridor improvements discussed in the previous sections represent significant infrastructure alterations. This section is intended to provide further guidance as to the implementation timeline of the recommended alternatives so that maximum existing infrastructure usage is achieved prior to the implementation of corridor capacity

improvements. Exhibit 6-9 provides a flowchart which illustrates the anticipated implementation of corridor improvements beginning with the existing corridor conditions.

Table 6-1 Estimated Construction Costs of Recommended Improvements

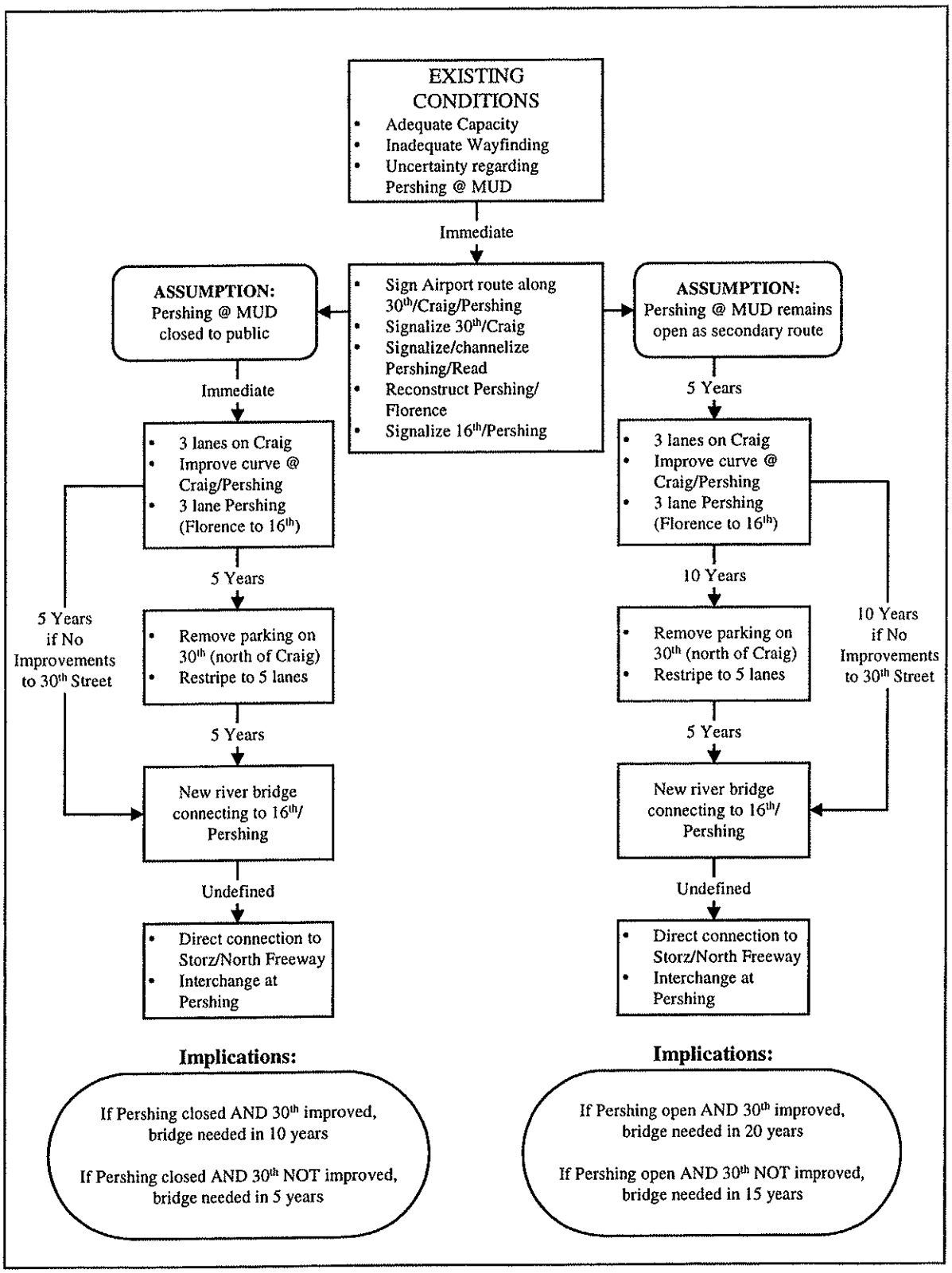
Recommended Improvement	Estimated Construction Cost
Immediate Improvements	
Improve signing along 30th/Craig/Pershing	$50,000
I-680/30th – Extend northbound left turn lane	$20,000
30th/Craig – Restriping along 30th, Install traffic signal	$75,000
Pershing/Florence – Improve intersection geometry	$140,000
Pershing/Read – Add turn lanes, Install traffic signal	$450,000
Pershing/16th – Add turn lanes, Install traffic signal	$220,000
Subtotal	**$955,000**
Short-Term Improvements	
Reconstruct Craig and Pershing to 3 lanes, add right turn lanes	$1,400,000
Remove parking on 30th, Restripe to 5-lane section*	$10,000
Subtotal	**$1,410,000**
Long-Term Improvements	
New river bridge and approach roadways (Alternative 5)	**$31,300,000**

* Does not include mitigation of loss of parking.

The recommended immediate improvements will provide adequate corridor operations for approximately five years assuming that the portion of Pershing Drive owned by MUD remains open. However, if this segment is closed in the near future, the recommended short-term improvements will be needed immediately. As discussed in previous sections, the staged implementation of short-term alternatives will provide the needed capacity in a stepping-stone manner. In other words, capacity improvements within the corridor should be implemented where needed the most.

The initial short-term improvement will be to provide a three-lane facility on Craig Street and Pershing Drive with the associated curve improvement at Craig Street and Pershing Drive. This short-term improvement should provide another ten years of capacity assuming the MUD portion of Pershing remains open and five years of capacity if the MUD portion of Pershing Drive is closed. The secondary short-term improvement will be to remove parking on 30th Street and restripe it to create a continuous five-lane section north of Craig Street. This additional short-term improvement will provide approximately five more years prior to reaching corridor capacity.

Exhibit 6-9 Implementation Flowchart



Regardless of any further developments within the corridor, a long-term capacity-adding alternative is needed. This study recommends a new river crossing be implemented as soon as five years or up to twenty years, depending on the contributing circumstances. The following implications arise from the corridor timeline analysis. First, if the MUD portion of Pershing Drive is closed and improvements to 30th Street are completed, a new river crossing will be needed in approximately ten years. Second, if the MUD portion of Pershing drive is closed and no improvements to 30th Street are completed, a new river crossing will be needed in approximately five years. Conversely, if the MUD portion of Pershing remains open and 30th Street is improved, a new river crossing will be needed in twenty years. However, if the MUD portion of Pershing Drive remains open and 30th Street is not improved a new river crossing will be needed in fifteen years.

CHAPTER 7: LONG TERM SYSTEM POTENTIAL

A secondary advantage to a new river crossing if located at alternative 1 or 5 is the potential for a future direct connection to the North Freeway via the Storz Expressway. Although a connection could be provided through the other alternatives it would not be as direct or free-flowing. This connection could provide regional traffic flow benefits that were not fully explored as part of this study.

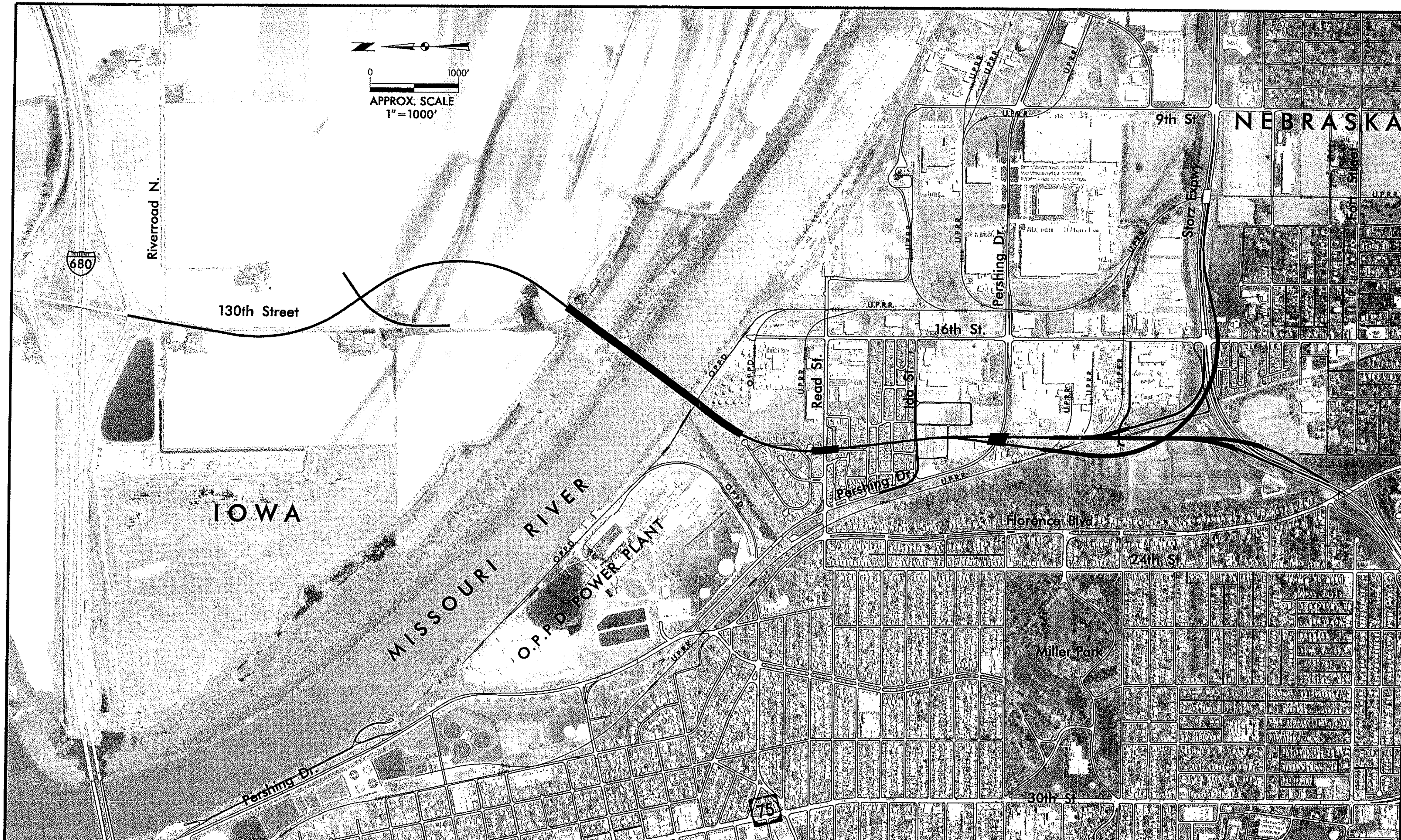
This alignment utilizes Alternative 5 from Chapter 5 and is shown in Exhibit 7-1. The recommended bridge is shown with the option of extending the roadway to the south and providing a directional interchange with Storz Expressway.

Although this improvement would not necessarily serve traffic between I-680 and Eppley Airfield, it would provide benefits related to regional travel. Although not providing a true freeway connection to I-680 as proposed by the North Freeway in the 1970's, it would provide a much improved connection than exists along 30th Street today. The connection would also provide an enhanced connection from I-680 to the downtown area including the proposed arena/convention center.

South of Pershing Drive, a large portion of the extension would be constructed on structure to avoid impacts to several UPRR spurs and to the drainage detention facility bordered by the Storz Expressway, Florence Boulevard and the primary UPRR spur. This detention area is currently used as a soccer/rugby complex. Two of the fields would likely be impacted by the recommended alignment.

The southbound to eastbound ramp would fly over 16th Street prior to merging with Storz Expressway. Preliminary investigations indicate that the ramps between the new roadway and the Storz Expressway to the west will provide adequate ramp separation with the ramps of the Storz Expressway/Florence Boulevard interchange. Detailed study was not conducted of the Storz Freeway interchange at 30th Street. It is possible that some modification would be needed to accommodate increased demand.

It was not the intent of this study to detail out this type of connection and study all the design aspects. A very rough cost estimate was completed that indicated the extension from Pershing to Storz with a directional interchange as shown in Exhibit 7-1 could cost between $35 and $40 million.



HDR
HDR Engineering, Inc.

Metropolitan Area Planning Agency
I– 680 TO EPPLEY AIRFIELD CORRIDOR STUDY

RECOMMENDED LONG–TERM IMPROVEMENT
NEW BRIDGE /CONNECTION TO STORZ

EXHIBIT
7–1

CHAPTER 8: SUMMARY/CONCLUSIONS

Unlike "traditional" corridor studies in congested areas where the primary objective is to determine ways to increase roadway capacity, this study's objective was based on the desire to improve ***access*** between I-680 and the airport and the surrounding industrial area. Although the exiting route is confusing and cumbersome to unfamiliar drivers, technical capacity problems do not exist.

However, Eppley enplanements have doubled in the last six years and are projected to double again within 12 years. Cargo volume has risen even more dramatically. One out of four vehicles parked at Eppley are from out of state. Eppley has become the regional airport for a 120 mile radius of the midwest. Analysis indicates that the confusing roadway system will begin to experience capacity and delay problems in the near future with the roadway system exceeding capacity by up to 30%.

The current 5 year TIP indicate no plans to improve the roadway between I-680 and Eppley. Additionally the 2020 LRTP indicates a new 4 lane route from I-680 to the Storz Freeway via the UPRR railroad spur. MUD has no plans to abandon its need for this line, thus the current LRTP roadway connection does not appear feasible.

The primary objective of this study was to identify the need for, the type of, and location of a transportation facility to serve as a connection between Eppley Airfield and I-680. Based on traffic analyses performed as part of this study and based on funding constraints facing the participating agencies, this study recommends that this "connection" be developed as demand dictates and as funding permits. As such, the recommended improvements of this study are provided for three planning horizons: immediate, short-term, and long-term. Simply waiting 10 to 15 years for the implementation of a long term multi-million dollar improvement does nothing to address current deficiences.

IMMEDIATE TERM IMPROVEMENTS

Immediate improvements address safety related or route guidance problems. Further, immediate improvements typically do not solve the overall corridor problems but they do buy valuable time that is needed to address the real corridor problems.

The existing corridor conditions in general, provide adequate capacity and LOS on all roadways to and from the airport. However, the existing route exhibits several non-capacity related deficiencies. The route is circuitous and requires trucks to use a separate route from passenger vehicles. Additionally, the existing corridor roadways are designed to minor arterial and/or collector standards and require traversing a stretch of private road along MUD. Further, four right-angle turns and three all-way stops are required along the signed roadway to the airport. Finally, poor pavement conditions exist throughout the existing corridor roadways.

Immediate improvements are recommended to address these existing deficiencies, regardless of long-term operational needs. These improvements will improve route delineation but will not address potential capacity deficiencies that would result from

closure of Pershing Drive, near MUD. Six immediate corridor improvements are recommended.

- Revise signed airport route to 30th Street / Craig Street / Pershing Drive
- Geometric improvements at I-680 / 30th Street interchange
- Striping / traffic signal improvements at 30th Street / Craig Street
- Geometric improvements at Pershing Drive / Florence Boulevard
- Geometric / traffic signal improvements at Pershing Drive / Read Street
- Geometric / traffic signal improvements at Pershing Drive / 16th Street

The immediate improvements listed above are estimated to cost approximately $1 million.

SHORT TERM IMPROVEMENTS

Short-term improvements expand on safety related and route guidance issues. Additionally, short-term improvements can begin to address capacity related problems and continue to provide time until the ultimate corridor solution is ready to be implemented.

The recommended short-term improvements in the corridor focus on the provision of additional capacity along the proposed signed route that was identified as an immediate improvement. Staged implementation of these improvements is recommended so that the additional capacity can be provided as needed. Two specific improvements are recommended.

- Reconstruct Craig Street and Pershing Drive
- Remove parking on 30th Street, north of Craig Street

The short term improvements are estimated to cost approximately $1.5 million.

LONG TERM IMPROVEMENTS

The recommended long-term corridor improvement is to construct a new Missouri River Bridge. This will provide optimum route delineation, route consistency for drive expectancy, improved safety, and provide adequate capacity for the horizon year traffic forecasts. A new bridge is superior to other alternatives that were considered because it would consolidate trucks and passenger vehicles on one route; it would provide better traffic operations than any other alternative; it would avoid impacts to the 30th and Pershing

Although less expensive, long term Nebraska side alternatives have significant impacts that could be considered fatal flaws or major impediments to implementation. Although more costly, river crossing options appear to have less impact and create more of an identifiable route to the industrial area and airport.

The long term bridge improvement is estimated to cost between $30 and $35 million.

TIMING OF IMPROVEMENTS

The timing of the improvements is based upon a technical application of capacity. A timeline based upon level of driver confusion is too subjective. From a clarity standpoint, it could be argued that the bridge is needed immediately.

Based upon capacity, this study recommends a new river crossing be implemented as soon as five years or up to twenty years, depending on the contributing circumstances related to Perhsing Drive and 30th Street. If the MUD portion of Pershing remains open and 30th Street is re-striped for five lanes, a new river crossing will be needed in twenty years.

The recommended immediate improvements will provide adequate corridor operations for approximately five years assuming that the portion of Pershing Drive owned by MUD remains open. However, if this segment is closed in the near future, the recommended short-term improvements will be needed immediately.

The initial short-term improvement, a three-lane facility on Craig Street and Pershing Drive with the associated curve improvement at Craig Street and Pershing Drive should provide another ten years of capacity (total of 15 years) assuming the MUD portion of Pershing remains open. This drops to only five years of capacity if the MUD portion of Pershing Drive is closed. The secondary short-term improvement will be to remove parking on 30th Street and restripe it to create a continuous five-lane section north of Craig Street. This additional short-term improvement will provide approximately five more years (total of 20 years) prior to reaching corridor capacity.

NEXT STEP

The first step is to ammend the current Long Range Transportation Plan to include the short and long term options. This provides formal identification to the need and indicates a desire for the various jurisdictions to construct the improvements when funds become available.

Neither project has been funded with the TIP (short term funded plan). Efforts should begin to identify and secure potential funding sources.

The next technical step for the long range plan would be to conduct the NEPA process. This would be necessary as part of the expenditure of federal funds. This study does establish the purpose and need for this project. Additionally the reasonable alternatives have been identified and an assessment begun. As part of the NEPA alternative process we recommend that the bridge alternatives (most likely one, four or five) be carried through the process with the partial rail alternative. Additional detail is needed to provide NEPA defensible reasons for the ultimate selection of an alignment.